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A SECOND VISIT

TO

THE UNITED STATES

OF

NORTH AMERICA.

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A SECOND VISIT

TO

THE UNITED STATES

OF

NORTH AMERICA.

BY

SIR CHARLES LYELL, F.R.S.

PRESIDENT OF THE GEOLOGICAL SOCIETY OF LONDON,
AUTHOR OF "THE PRINCIPLES OF GEOLOGY,"
AND "TRAVELS IN NORTH AMERICA."

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A SECOND VISIT

TO

THE UNITED STATES

IN THE YEARS 1845—6.

CHAP. XX.

Darien to Savannah.—Black Baptist Church and Preacher.—Negro Prayer.—Negro Intelligence.—Bribery of Irish Voters.—Dirt-Eaters.—Railway Expedition on Hand-Car.—Geology of Georgia.—Negroes more progressive in Upper Country.—Indifference of Georgians to Winter Cold.—Want of Elbow-Room in Pine-Barrens.

Jan. 9. 1846.—When I had finished my geological examination of the southern and maritime part of Georgia, near the mouth of the Alatamaha river, I determined to return northward to Savannah, that I might resume my survey at the point where I left off in 1842*, and study the tertiary and cretaceous strata between the Savannah and Alabama rivers.

On our way back from Hopeton to Darien, Mr. Couper and his son accompanied us in a canoe, and we passed through the General's Cut, a canal so called because, according to tradition, Oglethorpe's soldiers cut it out with their swords in one day. We met a great number of negroes paddling their canoes on their way back from Darien, for it was Saturday, when they are generally allowed a half holiday, and they had gone to sell on their own account their poultry, eggs, and fish, and were bringing back tobacco, clothes, and other articles of use or luxury.

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* See "Travels in North America," vol. i. pp. 155—174.

Having taken leave of our kind host, we waited some hours at Darien for a steamer, which was to touch there on its way from St. Augustine in Florida, and which conveyed us speedily to Savannah. Next day, I attended afternoon service in a Baptist church at Savannah, in which I found that I was the only white man, the congregation consisting of about 600 negroes, of various shades, most of them very dark. As soon as I entered, I was shown to a seat reserved for strangers, near the preacher. First the congregation all joined, both men and women, very harmoniously in a hymn, most of them having evidently good ears for music, and good voices. The singing was followed by prayers, not read, but delivered without notes by a negro of pure African blood, a grey-headed venerable-looking man, with a fine sonorous voice, named Marshall. He, as I learnt afterwards, has the reputation of being one of their best preachers, and he concluded by addressing to them a sermon, also without notes, in good style, and for the most part in good English; so much so, as to make me doubt whether a few ungrammatical phrases in the negro idiom might not have been purposely introduced for the sake of bringing the subject home to their familiar thoughts. He got very successfully through one flight about the gloom of the valley of the shadow of death, and, speaking of the probationary state of a pious man left for a while to his own guidance, and when in danger of failing saved by the grace of God, he compared it to an eagle teaching her newly fledged offspring to fly by carrying it up high into the air, then dropping it, and, if she sees it falling to the earth, darting with the speed of lightning to save it before it reaches the ground. Whether any eagles really teach their young to fly in this manner, I leave the ornithologist to decide; but when described in animated and picturesque language, yet by no means inflated, the imagery was well calculated to keep the attention of his hearers awake. He also inculcated some good practical maxims of morality, and told them they were to look to a future state of rewards and punishments in which God would deal impartially with "the poor and the rich, the black man and the white."

I went afterwards, in the evening, to a black Methodist church, where I and two others were the only white men in the whole congregation; but I was less interested, because the service and preaching were performed by a white minister. Nothing in my whole travels gave me a higher idea of the capabilities of the negroes, than the actual progress which they have made, even in a part of a slave state, where they outnumber the whites, than this Baptist meeting. To see a body of African origin, who had joined one of the denominations of Christians and built a church for themselves,—who had elected a pastor of their own race and secured him an annual salary, from whom they were listening to a good sermon, scarcely, if at all, below the average standard of the compositions of white ministers,—to hear the whole service respectably, and the singing admirably performed, surely marks an astonishing step in civilisation.

The pews were well fitted up, and the church well ventilated, and there was no disagreeable odour in either meeting-house. It was the winter season, no doubt, but the room was warm and the numbers great. The late Mr. Sydney Smith, when he had endeavoured in vain to obtain from an American of liberal views, some explanation of his strong objection to confer political and social equality on the blacks, drew from him at length the reluctant confession that the idea of any approach to future amalgamation was insufferable to any man of refinement, unless he had lost the use of his olfactory nerves. On hearing which Mr. Smith exclaimed—

"'Et si non alium latè jactaret odorem
Civis erat!'*

And such, then, are the qualifications by which the rights of suffrage and citizenship are to be determined!"

A Baptist missionary, with whom I conversed on the capacity of the negro race, told me that he was once present when one of their preachers delivered a prayer, composed by himself, for the ordination of a minister of his sect, which, said he, was admirable in its conception, although the sentences were so ungrammatical, that they would pass, with a stranger, for mere gibberish. The prayer ran thus: —

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* Virgil, Georg. ii. 133.

> "Make he good, like he say,
> Make he say, like he good,
> Make he say, make he good, like he God."

Which may be thus interpreted: — Make him good as his doctrine, make his doctrine as pure as his life, and may both be in the likeness of his God.

This anecdote reminds me of another proof of negro intelligence, related to me by Dr. Le Conte, whose black carpenter came to him one day, to relate to him, with great delight, a grand discovery he had made, namely, that each side of a hexagon was equal to the radius of a circle drawn about it. When informed that this property of a hexagon had long been known, he remarked that if it had been taught him, it would have been practically of great use to him in his business.

There had been "a revival" in Savannah a short time before my return, conducted by the Methodists, in the course of which a negro girl had been so much excited, as to be thrown into a trance. The physician who attended her gave me a curious description of the case. If the nerves of only one or two victims are thus overwrought, it is surely more than questionable whether the evil does not counterbalance all the good done, by what is called "the awakening" of the indifferent.

I inquired one day, when conversing with some of the citizens here, whether, as New York is called the Empire State, Pennsylvania the Keystone State, Massachusetts the Bay State, and Vermont, when the question of its separation from New Hampshire was long under discussion, "the Future State,"—in short, as almost all had some name, had they any designation for Georgia? It ought, they said, to be styled the Pendulum State, for the Whigs and Democrats get alternately possession of power; so that each governor is of opposite politics to his predecessor. The metropolis, they added, imitates the example of the State, electing the mayor and aldermen of Savannah one year from the Democratic and the next from the Whig party. It has been of late a great point, in electioneering tactics, to secure the votes of fifty or sixty Irish labourers, who might turn the scale here, as they have so often done in New York, in the choice of city officers. In the larger city they were conciliated for some years by employment in the Croton waterworks, so that "pipe-laying" became the slang term for this kind of bribery; here, it ought to be called "sesbania-cutting," for they set the Hibernians to cut down a dense crop of a tall leguminous plant (*Sesbania vesicaria*), which covers the canal and the swamps round the city, growing to the height of fifteen feet, and, like the city functionaries, renewed every year. Some members of the medical college, constituting a board of health, have just come out with a pamphlet, declaring, that by giving to the sun's rays, in summer, free access to the mud in the bogs, and thus promoting the decay of vegetable matter, the cutting down of these reeds has caused malaria.

In the course of all my travels, I had never seen one opossum in the woods, nor a single racoon, their habits being nocturnal, yet we saw an abundant supply of both of them for sale in the market here. The negroes relish them much, though their flesh is said to be too coarse and greasy for the palate of a white man. The number of pine-apples and bananas in the market, reminded us of the proximity of the West Indies. We observed several negroes there, whose health had been impaired by dirt-eating, or the practice of devouring aluminous earth,—a diseased appetite, which, as I afterwards found, prevails in several parts of Alabama, where they eat clay. I heard various speculations on the origin of this singular propensity, called "geophagy" in some medical books. One author ascribes it to the feeding of slaves too exclusively on Indian corn, which is too nourishing, and has not a sufficiency in it of inorganic matter, so that when they give it to cattle, they find it best to grind up the cob and part of the stalk with the grain. But this notion seems untenable, for a white person was pointed out to me, who was quite as sickly, and had a green complexion, derived from this same habit; and I was told of a young lady in good circumstances, who had never been stinted of her food, yet who could not be broken of eating clay.

Jan. 13.—From Savannah we went by railway to Macon in Georgia, a distance of 191 miles, my wife going direct in a train which carried her in about twelve hours to her destination, accompanied by one of the directors of the railway company, who politely offered to escort her. The same gentleman supplied me with a hand-car and three negroes, so that I was able to perform the journey at my leisure, stopping at all the recent cuttings, and examining the rocks and fossils on the way. I was desirous of making these explorations, because this line of road traverses the entire area occupied by the tertiary strata between the sea and the borders of the granitic region, which commences at Macon, and the section was parallel to that previously examined by me on the Savannah river in 1842. When I came to low swampy grounds, or pine-barrens, where there were no objects of geological interest, my black companions propelled me onwards at the rate of ten or twelve miles an hour by turning a handle connected with the axis of the wheels. Their motions were like those of men drawing water from a well. Throughout the greater part of the route, an intelligent engineer accompanied me. As there was only one line of rail, and many curves, and as the negroes cannot be relied on for caution, he was anxious for my safety, while I was wholly occupied with my geology. I saw him frequently looking at his watch, and often kneeling down, like "Fine-ear" in the fairy tale, so as to place his ear in contact with the iron rails, to ascertain whether a passenger or luggage-train were within a mile or two. We went by Parramore's Hill, where the sandstone rocks detained me some time, and, at the ninety-fifth mile station from Savannah, I collected fossils, consisting of marine shells and corals. These were silicified in the burr-stone, of which mill-stones are manufactured. Near Sandersville I saw a limestone from which Eocene shells and corals are procured, as well as the teeth of sharks and the bones of the huge extinct cetacean called Zeuglodon. Here I had ample opportunities of confirming the opinion I had previously announced as the result of my labours in 1842, that this burr-stone, with its red, yellow, and white sands, and its associated porcelain clays or kaolin, constitutes one of the members of the Eocene group, and that the white limestone of S. Carolina and Georgia, once supposed to be cretaceous, really belongs to the same tertiary period.* Although the summit level of the railway attains an elevation of about 500 feet, descending afterwards somewhat abruptly to Macon, which is only 300 feet above the sea, it is surprising how we stole imperceptibly up this ascent, as if on a perfectly level plain, every where covered with wood, following chiefly the swampy valley of the Ogeechee river, in such a manner as to miss seeing all the leading features in the physical geography of the country. Had I not, when at Hopeton, seen good examples of that succession of steps, or abrupt escarpments, by which a traveller in passing from the sea coast to the granite region ascends from one great terrace to another, I should have doubted the accuracy of Bartram's description.†

I had many opportunities, during this excursion, of satisfying myself of the fact for which I had been prepared by the planters "on the sea-board," that the intelligence of the coloured race increased in the interior and upland country in proportion as they have more intercourse with the whites. Many of them were very inquisitive to know my opinion as to the manner in which marine shells, sharks' teeth, sea-urchins, and corals could have been buried in the earth so far from the sea and at such a height. The deluge had occurred to them as a cause, but they were not satisfied with it, observing that they procured these remains not merely near the surface, but from the bottom of deep wells, and that others were in flint stones. In some places, when I left the railway and hired a gig to visit plantations far from the main road, the proprietor would tell me he was unable to answer my questions, his well having been sunk ten or twelve years ago. In that period the property had changed hands two or three times, the former owners having settled farther south or south-west; but the estate had remained under the management of the same head negro, to whom I was accordingly referred. This personage, conscious of his importance, would begin by enlarging, with much self-complacency, on the ignorance of his master, who had been too short a time in those parts to understand anything I wished to know. When at length he condescended to come to the point, he could usually give me a clear account of the layers of sand, clay, and limestone they had passed through, and of fishes' teeth they had found, some of which had occasionally been preserved. In proportion as these coloured people fill places of trust, they are involuntarily treated more as equals by the whites. The prejudices which keep the races asunder would rapidly diminish, were they not studiously kept up by artificial barriers, unjust laws, and the re-action against foreign interference. In one of the small farms, where I passed the night, I was struck with the good manners and pleasant expression of countenance of a young woman of colour, who had no dash of white blood in her veins. She managed nearly all the domestic affairs of the house, the white children among the rest, and, when next day I learnt her age, from the proprietor, I expressed surprise that she had never married. "She has had many offers," said he, "but has declined all, for they were quite unworthy of her,—rude and uncultivated country people. I do not see how she is to make a suitable match here, though she might easily do so in a large town like Savannah." He spoke of her just as he might have done of a white free maid-servant.

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* See Quarterly Journ. of Geol. Society, 1845, p. 563.

† Ante, vol. i. pp. 345, 346.

If inter-marriages between the coloured and white races were not illegal here, how can we doubt that as Englishwomen sometimes marry black servants in Great Britain, others, who came out here as poor emigrants, would gladly accept an offer from a well-conducted black artizan or steward of an estate, a man of intelligence and sober habits, preferable in so many respects to the drunken and illiterate Irish settlers, who are now so unduly raised above them by the prejudices of race!

In one family, I found that there were six white children and six blacks, of about the same age, and the negroes had been taught to read by their companions, the owner winking at this illegal proceeding, and seeming to think that such an acquisition would rather enhance the value of his slaves than otherwise. Unfortunately, the whites, in return, often learn from the negroes to speak broken English, and, in spite of losing much time in unlearning ungrammatical phrases, well-educated people retain some of them all their lives.

As I stopped every evening at the point where my geological work for the day happened to end, I had sometimes to put up with rough quarters in the pine-barrens. It was cold, and none of my hosts grudged a good fire, for large logs of blazing pine-wood were freely heaped up on the hearth, but the windows and doors were kept wide open. One morning, I was at breakfast with a large family, at sunrise, when the frost was so hard, that every pool of water in the road was encrusted with ice. In the course of the winter, some ponds, they said, had borne the weight of a man and horse, and there had been a coroner's inquest on the body of a man, lately found dead on the road, where the question had been raised whether he had been murdered or frozen to death. They had placed me in a thorough draught, and, unable to bear the cold any longer, I asked leave to close the window. My hostess observed, that "I might do so, if I preferred sitting in the dark." On looking up, I discovered that there was no glass in the windows, and that they were furnished with large shutters only. For my own part, I would willingly have been content with the light which the pine-wood gave us, but seeing the women and girls, with bare necks and light clothing, perfectly indifferent to the cold, I merely asked permission to put on my great coat and hat. These Georgians seemed to me, after their long summer, to be as insensible to the frost as some Englishmen the first winter after their return from India, who come back charged, as it were, with a superabundant store of caloric, and take time, like a bar of iron out of a furnace, to part with their heat.

A farmer near Parramore's Hill, thinking I had come to settle there, offered to sell me some land at the rate of two dollars an acre. It was well timbered, and I found that the wood growing on this sandy soil is often worth more than the ground which it covers. Another resident in the same district, told me he had bought his farm at two and a half dollars (or about half-a-guinea) an acre, and thought it dear, and would have gone off to Texas, if he were not expecting to reap a rich harvest from a thriving plantation of peach trees and nectarines, just coming into full bearing. A market for such fruit had recently been opened by the new railway, from Macon to Savannah. He complained of want of elbow-room, although I found that his nearest neighbour was six or seven miles distant; but, he observed, that having a large family of children, he wished to lay out his capital in the purchase of a wider extent of land in Texas, and so be the better able to provide for them.

CHAP. XXI.

Indian Mounds and Block-house at Macon, Georgia.—Fashionists. — Funeral of Northern Man. — Geology and silicified Corals and Shells.—Stage travelling to Milledgeville.—Negro Children. — Home-made Soap. — Decomposition of Gneiss. — Deep Ravines recently excavated after clearing of Forest. — Man shot in a Brawl. — Disappointed Place-Hunter.— Lynch Law in Florida. — Repeal of English Corn-Laws. — War Spirit abating.

Jan. 15. 1846.—WHEN I was within twenty miles of Macon, I left the hand-car and entered a railway-train, which carried me in one hour into the town. About a mile south of the place, we passed the base of two conical Indian mounds, the finest monuments of the kind I had ever seen, The first appearance of a large steam-vessel ascending one of the western tributaries of the Mississippi, before a single Indian has been dispossessed of his hunting grounds, or a single tree of the native forest has been felled, scarcely affords a more striking picture of a wilderness invaded by the arts of civilised life, than Macon, in Georgia, resounding to the sound of a locomotive engine. On entering the town, my eye was caught by a striking object, a wooden edifice of very peculiar structure and picturesque form, crowning one of the hills in the suburbs. This, I was told, on inquiry, was a block-house, actually in use against the Indians only twenty-five years ago, before any habitations of the white men were to be seen in the forest here. It was precisely one of those wooden forts so faithfully described by Cooper in the "Path-finder." After the mind has become interested with such antiquities, it is carried back the next moment to the modern state of things by an extraordinary revulsion, when a fellow-passenger, proud of the sudden growth of his adopted city, tells you that another large building, also conspicuous on a height, is a female seminary lately established by the Methodists, "where all the young ladies take degrees;" and then, as you pace the streets with your baggage to the hotel, another says to you, "There go two of our fashionists," pointing to two gaily-dressed ladies, in the latest Parisian costume.

I had seen, in the pale countenances of the whites in the pine-woods I had lately travelled through, the signs of much fever and ague prevalent in the hot season in Georgia, but at Macon we heard chiefly of consumptive patients, who have fled from the Northern States in the hope of escaping the cold of winter. The frost, this year, has tried them severely in the South. Two days before I reached Macon, a young northern man had died in the hotel where my wife was staying, a melancholy event, as none of his friends or relatives were near him. Lucy, the chambermaid of the hotel, an intelligent bright mulatto, from Maryland, who expressed herself as well as any white woman, came to tell my wife that the other ladies of the house were to be present at the funeral, and invited her to attend. She found the two drawing-rooms thrown into one, and the coffin placed on a table between the folding doors, covered with a white cloth. There were twenty or thirty gentlemen on the one side, and nearly as many ladies and children on the other, none of them in mourning. The Episcopal clergyman who officiated, before reading the usual burial service, delivered a short and touching address, alluding to the stranger cut off in his youth, far from his kindred, and exhorting his hearers not to defer the hour of repentance to a death-bed, when their reason might be impaired or taken from them. After the prayers, six of the gentlemen came forward to carry the coffin down stairs, to put it into a small hearse drawn by a single horse, and three carriages followed with as many as they could hold, to the cemetery of Rose Hill. This burial-ground is in a beautiful situation on a wooded hill, near the banks of the Ocmulgee and overlooking the Falls.

These Falls, like so many of those on the rivers east of the Alleghanies, are situated on the line of junction of the granitic and tertiary regions.* The same junction may also be seen at the bridge over the Ocmulgee, at Macon, the red loam of the tertiary formation resting there on mica schist. At the distance of one mile south-east of the town, a railway cutting has exposed a series of beds of yellow and red clay, with accompanying sands of tertiary formation, and, at the depth of forty feet, I observed a large fossil tree converted into lignite, the concentric rings of annual growth being visible. Receding from the granitic rocks, six or eight miles still farther to the south-east, I found at Brown Mountain, a bluff on the Ocmulgee river, and at other places in the neighbourhood, a great many siliceous casts of fossil shells and corals, and among others a large nautilus, the whole indicating that these beds of cherty sandstone and impure limestone belong to the Eocene period.

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* See "Travels in N. America," vol. i. p. 132.

As there is much kaolin in this series of chert and burr-stone strata, I have little doubt that the petrifaction of fossil wood, and of shells and corals, has taken place in consequence of the decomposition of the imbedded felspathic rocks and crystals of felspar, taking place simultaneously with the putrefaction of the organic bodies. The silex, just set free from its chemical combination in the felspar, would replace each organic particle as fast as it decayed or was resolved into its elements.

From Macon I went to Milledgeville, twenty-five miles to the north-east, the capital of Georgia. Instead of taking the direct road, we made a detour, going the first thirty miles on the Savannah railway, to a station called Gordon, where we found a stage-coach ready to drag us through the deep sands of the pine-barrens, or to jolt us over corduroy roads in the swamps. As we were traversing one of the latter, at the rate of half a mile an hour, I began to contrast the speed of the new railway with stage-travelling. Our driver maintained that he could go as fast as the cars. "How do you make that out?" said I. "Put a locomotive," he replied, "on this swamp, and see which will get on best. The most you can say is, that each kind of vehicle runs fastest on its own line of road."

We were passing some cottages on the way-side, when a group of children rushed out, half of them white and half negro, shouting at the full stretch of their lungs, and making the driver fear that his horses would be scared. They were not only like children in other parts of the world, in their love of noise and mischief, but were evidently all associating on terms of equality, and had not yet found out that they belonged to a different caste in society. One of our passengers was a jet black youth, about ten years old, who got down at a lone house in the woods, from the door of which two mulatto boys a year or two younger ran out. There was much embracing and kissing, and mutual caressing, with more warmth of manner than is usually shown by the whites. We were glad to see the white mistress of the house, probably the owner of them and their parents, looking on with evident pleasure and interest at the scene.

Milledgeville, a mere village, though the capital of the State, is provided with four neat and substantial wooden churches, clustered together, the Presbyterian, Baptist, Methodist, and Episcopalian. In the latter we found there was to be no service, as the clergyman had been recently "called" to a larger church, newly built, at Savannah. The Presbyterian minister was from New England, and an excellent preacher. He exhorted his congregation to take the same view of their short sojourn on this globe, which the emigrant takes of his journey to the far west, bearing patiently great hardships and privations, because, however severe at the time, he knows they will soon end, and prove momentary in their duration, in comparison with the longer period which he hopes to spend in a happier land.

At our hotel apologies were made to us by a neatly-dressed coloured maid, for the disorderly state of our room, the two beds having been recently occupied by four members of the Legislature, who, according to her, "had turned the room into a hog-pen, by smoking and spilling their brandy and wine about the floor."

While I was geologising in the suburbs, the Governor's lady called on my wife and took her to her residence, called here the "Executive Mansion," as appears by the inscription over the door. It contained some handsome reception-rooms newly furnished by the last Governor, but the white ground of a beautiful Axminster carpet had been soiled and much damaged the first evening after it was put down, at a levee, attended by several hundred men, each walking in after a heavy rain with his shoes covered with mud.

When the Governor's wife paid us a second visit, our landlady made herself one of the party just as if we were all visitors at her house. She was very much amused at my wife's muff, having never seen one since she was a girl, half a century before, at Baltimore, yet the weather was now cold enough to make such an article of dress most comfortable. Among other inquiries, she said to my wife, "Do tell me how you make your soap in England." Great was her surprise to hear that ladies in that country were in the habit of buying the article in shops, and would be much puzzled if called upon to manufacture it for themselves. As it was evident she had never studied Adam Smith on the Division of Labour, she looked upon this fine-lady system of purchasing every article at retail stores, as very extravagant. "That's the way they do in the North," said she, "though I never could understand where all their money comes from." She then explained how economically she was able to supply herself with soap. "First, there is the wood, which costs nothing but the trouble of felling the trees; and, after it has served for fuel, it yields the ashes, from which we get the potash. This is mixed with the fat of sixty hogs, which costs nothing, for what else could I do with all this fat at killing time? As for the labour, it is all done by my own people. I have nine maids, and they make almost everything in the house, even to the caps I wear." Touching the soap, she observed, we must be careful to select the ashes of the oak, hiccory, ash, and other hard wood, for the pines yield no potash; a remark which led me to speculate on the luxuriant growth of the long-leaved pines in the purely siliceous tertiary soils, from which it would have been difficult to conceive how the roots of the trees could extract any alkaline matter, whereas the soil of the "hiccory grounds" is derived from the disintegration of granitic rocks, which are very felspathic here, and are decomposing in situ.

Having occasion to hire a horse, I found that the proprietor of the livery stables was a coloured man, who came himself to bargain about the price, which was high compared to that asked in the North.

The site of Milledgeville is 577 feet above the level of the sea, and, like Macon, it stands on the boundary of the tertiary and granitic region. Dr. J. R. Cotting, who had been employed by the State to make a geological survey of part of Georgia, showed me in the State House some fossils collected by him, and he accompanied me in an excursion into the neighbourhood of the capital. It is well worthy of remark, that here, as everywhere in Georgia and Alabama, there are loose blocks of granite and gneiss strewed over the granitic area; but no fragments of them are ever seen to cross the boundary into the area composed of the tertiary strata, where small pebbles only are seen washed out of the sands. Farther to the north, in Massachusetts, for example, and the island of Martha's Vineyard, we see enormous erratics of granite, twenty-five and thirty feet in diameter, which must have come from the north, probably from the mountains of New Hampshire, resting on the tertiary clays and rocks*; and in Long Island (New York), a variety of transported blocks repose upon, or are interstratified with, very modern deposits. In the Southern States the same causes have not been in action, and if we suppose icebergs to have been the transporting power in the north, it seems natural that their action should not have extended to the Southern States, so as to carry fragments of crystalline rocks out of the granitic region. Yet it is striking, around Milledgeville, to see so many large detached and rounded boulders of granite lying on the surface of the soil, and all strictly confined within the limits of the granitic region. One of these, on the slope of a hill three miles from the town, resting on gneiss, measured twelve feet in its longest diameter, and was four feet high. I presume that these boulders are nearly in situ; they may have constituted "tors" of granite, like those in Cornwall, fragments of masses, once more extensive, left by denudation at a period when the country was rising out of the sea, and fragments may have been occasionally thrown down by the waves, and swept to a small distance from their original sites. The latitude of Milledgeville is 32° 20′ north, or considerably to the south of the most southern limits to which the northern drift with its erratics has hitherto been traced in the United States.

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* Travels in N. America, vol. i. p. 259. chap. xii.

Another most singular phenomenon in the environs of Milledgeville is the depth to which the gneiss and mica schist have decomposed in situ. Some very instructive sections of the disintegrated rocks have been laid open in the precipices of recently formed ravines. Were it not that the original intersecting veins of white quartz remain unaltered to show that the layers of sand, clay, and loam are mere laminæ of gneiss and mica schist, resolved into their elements, a geologist would suppose that they were ordinary alternations of sandy and clayey beds with occasional cross stratification, the whole just in the state in which they were first deposited. Now and then, as if to confirm the deception, a large crystal of felspar, eight or ten inches long, is seen to retain its angles, although converted into kaolin. Similar crystals, almost as perfect, may be seen washed into the tertiary strata south of the granitic region, where white porcelain clays, quartzose, gravel, sand, and micaceous loam are found, evidently derived from the waste of decomposed crystalline rocks. I am not surprised, therefore, that some geologists should have confounded the ancient gneiss of this district, thus decomposed in situ, with the tertiary deposits. Their close resemblance confirms me in the opinion, that the arrangement of the gneiss and mica schist in beds with subordinate layers, both horizontal and oblique, was originally determined, in most cases at least, by aqueous deposition, although often modified by subsequent crystalline action.

The surprising depth of some of the modern ravines, in the neighbourhood of Milledgeville, suggests matter of curious speculation. At the distance of three miles and a half due west of the town, on the direct road to Macon, on the farm of Pomona, is the ravine represented in the annexed wood-cut (p. 25.). Twenty years ago it had no existence; but when the trees of the forest were cut down, cracks three feet deep were caused by the sun's heat in the clay; and, during the rains, a sudden rush of water through these cracks, caused them to deepen at their lower extremities, from whence the excavating power worked backwards, till, in the course of twenty years, a chasm, measuring no less than 55 feet in depth, 300 yards in length, and varying in width from 20 to

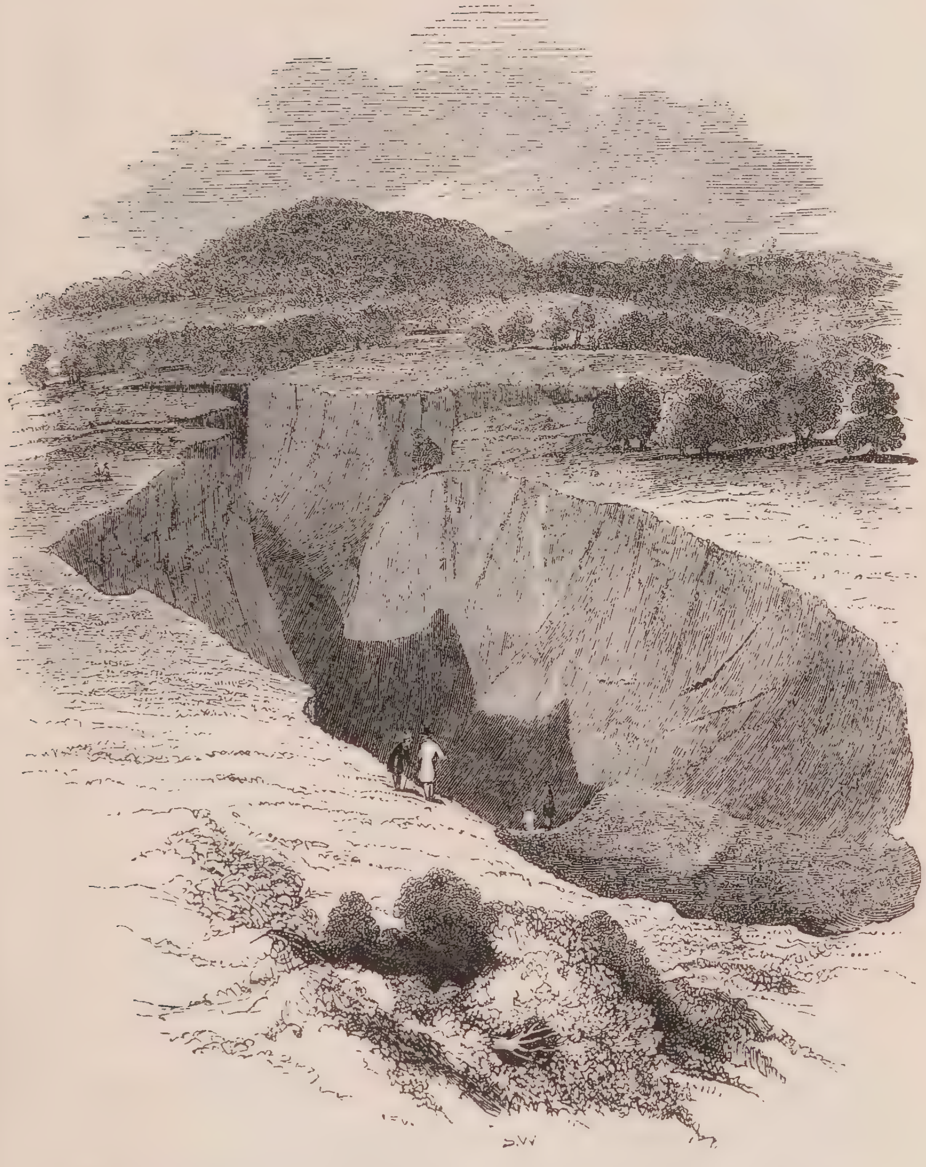
180 feet, was the result. (See fig. 7. p. 25.) The high road has been several times turned to avoid this cavity, the enlargement of which is still proceeding, and the old line of road may be seen to have held its course directly over what is now the widest part of the ravine. In the perpendicular walls of this great chasm appear beds of clay and sand, red, white, yellow, and green, produced by the decomposition in situ of hornblendic gneiss, with layers and veins of quartz, as before-mentioned, and of a rock consisting of quartz and felspar, which remain entire to prove that the whole mass was once crystalline.

In another place I saw a bridge thrown over a recently formed gulley, and here, as in Alabama, the new system of valleys and of drainage, attendant on the clearing away of the woods, is a source of serious inconvenience and loss.

I infer, from the rapidity of the denudation caused here by running water after the clearing or removal of wood, that this country has been always covered with a dense forest, from the remote time when it first emerged from the sea. However long may have been the period of upheaval required to raise the marine tertiary strata to the height of more than 600 feet, we may conclude that the surface has been protected by more than a mere covering of herbage from the effects of the sudden flowing off of the rain water.

I know it may be contended that, when the granite and gneiss first rose as islands out of the sea, they may have consisted entirely of hard rock, which resisted denudation, and therefore that we can only affirm

Fig. 7.



Ravine on the Farm of Pomona, near Milledgeville, Georgia, January, 1846.

Excavated in the last twenty years, *55* feet deep, and 180 feet broad.

that the forest has been continuous from the time of the decomposition and softening of the upper portion of these rocks. But I may reply, that similar effects are observable, even on a grander scale, in recently excavated ravines seventy or eighty feet deep, in some newly cleared parts of the tertiary regions of Alabama, as in Clarke county for example, and also in some of the cretaceous strata of loose gravel, sand, and clay, in the same State at Tuscaloosa. These are at a much greater height above the sea, and must, from the first, have been as destructible as they are now.

We returned to Macon by our former route, through the pine woods, and when we stopped to change horses, a lady, who was left for a time alone in the coach with my wife, informed her, that a young man who had been sitting opposite to them, had, the day before, shot an Irishman in a tavern, and was flying from justice. A few days later we learnt that the wounded man had not died, but as it was a Penitentiary offence, it was prudent for the culprit to keep out of the way for a time. On hearing this, I asked one of my companions, how it was possible, when such affairs were occurring, and the police was so feeble, we could travel night and day, and feel secure from personal violence. "There is no danger here," he said, "of robbery, as in Europe, for we have none who are poor, or rendered vicious and desperate by want. No murders are committed here except in personal quarrels, and are almost always the act of restless and unquiet spirits, who seek excitement in gambling and drink. The wars in Texas relieved us of many of these dare-devils."

One of our fellow-travellers seemed to be a disappointed place-hunter, who had been lobbying the Houses of Legislature in vain for the whole session. He was taking his revenge by telling many a story against an assembly, which had been so obtuse as not to discover his merits. Twelve of them, he said, from the upper country, could not even read, and one of these happening, when in the House, to receive an invitation to the Governor's annual dinner, rose, and, holding the card in his hand, with the writing upside down, said, "Mr. Speaker, I am determined to oppose this resolution." Another, when they were debating whether they should move the Capitol, or seat of legislature, from Milledgeville to Macon, went out, and, on resuming his seat, declared they were wasting their time, for he had measured, and made a rough estimate of the weight of the building (which was of stone), and found, on calculation, that all the oxen in Georgia could not drag it a single mile!

There was much talk here of a recent exhibition on the frontiers of Georgia, of what is commonly called Lynch Law, which invalidated the assertion of my companion in regard to the absence of robbers. Many people having been plundered of their property, especially their negroes, organised a private association for putting down the thieves, who came from Florida, and having arrested one of them, named Yoermans, they appointed a committee of twelve to try him. Witnesses having been sworn, a verdict of guilty was returned, and the punishment of death decided upon, by a vote of six to one. They then crossed from Georgia into Florida, where the prisoner confessed, under the gallows, that he was a murderer and robber, and called upon a preacher of the gospel, three or four of whom were present, as well as a justice of the peace, to pray for him, after which he was hung.

I expressed my horror at these transactions, observing that Florida, if in so rude and barbarous a state, ought not to have been admitted into the Union. My companions agreed to this, but said they believed the man had fair play on his trial, and added, "If you were a settler there, and had no other law to defend you, you would be glad of the protection of Judge Lynch."

The news had just reached Milledgeville and Macon of the English Premier's speech in favour of the free importation of foreign corn, a subject discussed here with as much interest as if it were a question of domestic policy. The prospect of increased commercial intercourse with England, is regarded by all as favourable to peace, especially as the Western States, the most bellicose in the whole Union, will be the chief gainers. Even before this intelligence arrived, the tone of the public mind was beginning to grow somewhat less warlike. The hero in a new comic piece, on the stage at New York, personifies the member for Oregon, and talks big about "our destiny," and "the whole of Oregon or none." We also observe an extract from the "North American Review" going the round of the newspapers, in which the Oregon dispute is compared to

Dandie Dinmont's famous law-suit with Jock o'Dawston about the marches of their farms, and Counsellor Pleydell's advice to his client is recommended for imitation.

"We should have a war to-morrow," said a Whig politician to me at Macon, "if your democracy were as powerful as ours, for the most radical of your newspapers are the most warlike. Your ministers seem more free from anti-American prejudices than the ordinary writers of travels, reviews, or newspaper articles, and they have a great advantage over our government at Washington. One of our statesmen, a late candidate for the presidentship, is said to have declared, that when so many millions are admitted into the Cabinet, it is scarcely possible to manage a delicate point of foreign policy with discretion."

CHAP. XXII.

Macon to Columbus by Stage.—Rough Travelling.—Passage of Flint River.—Columbus.—Recent Departure of Creek Indians.—Falls of the Chatahoochie.—Competition of Negro and White Mechanics.—Age of Pine Trees.—Abolitionist "Wrecker" in Railway Car.—Runaway Slave.—Sale of Novels by News-boys.—Character of Newspaper Press.—Geology and Cretaceous Strata, Montgomery.—Curfew.—Sunday School for Negroes.—Protracted Meeting.

Jan. 21. 1846.—Hitherto we had travelled from the north by railway or steam-ship, but from Macon, on our way south, we were compelled to resort to the stage-coach, and started first for Columbus. For the first time, we remarked that our friends, on parting, wished us a *safe* journey, instead of a pleasant one, as usual. There had been continued rains, and the roads were cut up by waggons bringing heavy bales of cotton to the Savannah railroad. We passed Knoxville, a small and neat town, and, after dark, supped at a small road-side inn, on pork-chops, waffles, and hominy, or porridge, made of Indian meal. Here we were told that the stage of the night before had been water-bound by the rising of the rivers. We went on, however, to the great Flint river, where the stage drove into a large flat boat or raft. The night was mild, but dark, and the scene which presented itself very picturesque. A great number of negroes were standing on both banks, chattering incessantly, and holding in their hands large blazing torches of pine-wood, which threw a red light on the trees around. The river was much swollen, but we crossed without impediment. It was the first stream we had come to of those flowing into the Gulf of Mexico.

Our coach was built on a plan almost universal in America, and like those used in some parts of France, with three seats, the middle one provided with a broad leather strap, to lean back upon. The best places are given to the ladies, and a husband is seated next his wife. There are no outside passengers, except occasionally one sitting by the driver's side. We were often called upon, on a sudden, to throw our weight first on the right, and then on the left side, to balance the vehicle and prevent an upset, when one wheel was sinking into a deep rut. Sometimes all the gentlemen were ordered to get out in the dark, and walk in the wet and muddy road. The coachman would then whip on his steeds over a fallen tree or deep pool, causing tremendous jolts, so that my wife was thrown first against the roof, and then against the sides of the lightened vehicle, having almost reason to envy those who were merely splashing through the mud. To sleep was impossible, but at length, soon after daybreak, we found ourselves entering the suburbs of Columbus; and the first sight we saw there was a long line of negroes, men, women, and boys, well dressed and very merry, talking and laughing, who stopped to look at our coach. On inquiry, we were told that it was a gang of slaves, probably from Virginia, going to the market to be sold.

Columbus, like so many towns on the borders of the granitic and tertiary regions, is situated at the head of the navigation of a large river, and the rapids of the Chatahoochie are well seen from the bridge by which it is here spanned. The vertical rise and fall of this river, which divides Georgia from Alabama, amounts to no less than sixty or seventy feet in the course of the year; and the geologist should visit the country in November, when the season is healthy, and the river low, for then he may see exposed to view, not only the horizontal tertiary strata, but the subjacent cretaceous deposits, containing ammonites, baculites, and other characteristic fossils. These organic remains are met with some miles below the town, at a point called "Snake's Shoals;" and Dr. Boykin showed us a collection of the fossils, at his agreeable villa in the suburbs. In an excursion which I made with Mr. Pond to the Upotoy Creek, I ascertained that the cretaceous beds are overlaid everywhere by tertiary strata, containing fossil wood and marine shells.

The last detachment of Indians, a party of no less than 500, quitted Columbus only a week ago for Arkansas, a memorable event in the history of the settlement of this region, and part of an extensive and systematic scheme steadily pursued by the Government, of transferring the Aborigines from the Eastern States to the Far-West.

Here, as at Milledgeville, the clearing away of the woods, where these Creek Indians once pursued their game, has caused the soil, previously level and unbroken, to be cut into by torrents, so that deep gullies may everywhere be seen; and I am assured that a large proportion of the fish, formerly so abundant in the Chatahoochie, have been stifled by the mud.

The water-power at the rapids has been recently applied to some newly-erected cotton mills, and already an anti-free-trade party is beginning to be formed. The masters of these factories hope, by excluding coloured men—or, in other words, slaves—from all participation in the business, to render it a genteel employment for white operatives; a measure which places in a strong light the inconsistencies entailed upon a community by slavery and the antagonism of races, for there are numbers of coloured mechanics in all these Southern States very expert at trades requiring much more skill and knowledge than the functions of ordinary work-people in factories. Sevèral New Englanders, indeed, who have come from the North to South Carolina and Georgia, complain to me that they cannot push on their children here, as carpenters, cabinet-makers, blacksmiths, and in other such crafts, because the planters bring up the most intelligent of their slaves to these occupations. The landlord of an inn confessed to me, that, being a carrier, he felt himself obliged to have various kinds of work done by coloured artisans, because they were the slaves of planters who employed him in his own line. "They interfere," said he, "with the fair competition of white mechanics, by whom I could have got the work better done."

These Northern settlers are compelled to preserve a discreet silence about such grievances when in the society of Southern slave-owners, but are open and eloquent in descanting upon them to a stranger. They are struck with the difficulty experienced in raising money here, by small shares, for the building of mills. "Why," say they, "should all our cotton make so long a journey to the North, to be manufactured there, and come back to us at so high a price? It is because all spare cash is sunk here in purchasing negroes. In order to get a week's work done for you, you must buy a negro out and out for life."

From Columbus we travelled fifty-five miles west to Chehaw, to join a railway, which was to carry us on to Montgomery. The stage was drawn by six horses, but as it was daylight we were not much shaken. We passed through an undulating country, sometimes on the tertiary sands covered with pines, sometimes in swamps enlivened by the green palmetto and tall magnolia, and occasionally crossing into the borders of the granitic region, where there appeared immediately a mixture of oak, hiccory, and pine. There was no grass growing under the pine trees, and the surface of the ground was everywhere strewed with yellow leaves, and the fallen needles of the fir trees. The sound of the wind in the boughs of the long-leaved pines always reminded me of the waves breaking on a distant sea-shore, and it was agreeable to hear it swelling gradually, and then dying away, as the breeze rose and fell. Observing at Chehaw a great many stumps of these firs in a new clearing, I was curious to know how many years it would take to restore such a forest if once destroyed. The first stump I examined measured 2 feet 5 inches in diameter at the height of 3 feet from the ground, and I counted in it 120 rings of annual growth; a second measured less by 2 inches in diameter, yet was 260 years old; a third, at the height of 2 feet above the ground, although 180 years old, was only 2 feet in diameter; a fourth, the oldest I could find, measured, at the height of 3 feet above its base, 4 feet, and presented 320 rings of annual growth; and I could have counted a few more had the tree been cut down even with the soil. The height of these trees varied from 70 to 120 feet. From the time taken to acquire the above dimensions, we may confidently infer that no such trees will be seen by posterity, after the clearing of the country, except where they may happen to be protected for ornamental purposes. I once asked a surveyor in Scotland why, in planting woods with a view to profit, the oak was generally neglected, although I had found many trunks of very large size buried in peat-mosses. He asked if I had ever counted the rings of growth in the buried trees, to ascertain their age, and I told him I had often reckoned up 300, and once upwards of 800 rings; to which he replied, "then plant your shillings in the funds, and you will see how much faster they would grow."

Before reaching Chehaw, we stopped to dine at a small log-house in the woods, and had prepared our minds, from outward appearances, to put up with bad fare; but, on entering, we saw on the table a wild turkey roasted, venison steaks, and a partridge-pie, all the product of the neighbouring forest, besides a large jug of delicious milk, a luxury not commonly met with so far south.

The railway cars between Chehaw and Montgomery consisted, like those in the North, of a long apartment, with cross benches and a middle passage. There were many travellers, and among them one rustic, evidently in liquor, who put both his feet on one of the cushioned benches, and began to sing. The conductor told him to put his feet down, and afterwards, on his repeating the offence, lifted them off. On his doing it a third time, the train was ordered to stop, and the man was told, in a peremptory tone, to get out immediately. He was a strong-built labourer, and would have been much more than a match for the conductor, had he resisted; but he instantly complied, knowing, doubtless, that the officer's authority would be backed by the other passengers, if they were appealed to. We left him seated on the ground, many miles from any habitation, and with no prospect of another train passing for many a long hour. As we go southwards, we see more cases of intoxication, and hear more swearing.

At one of the stations we saw a runaway slave, who had been caught and handcuffed; the first I had fallen in with in irons in the course of the present journey. On seeing him, a New Englander, who had been with us in the stage before we reached Chehaw, began to hold forth on the miserable condition of the negroes in Alabama, Louisiana, Mississippi, and some other States which I had not yet visited. For a time I took for granted all he said of the sufferings of the coloured race in those regions, the cruelty of the overseers, their opposition to the improvement and education of the blacks, and especially to their conversion to Christianity. I began to shudder at what I was doomed to witness in the course of my further journeyings in the South and West. He was very intelligent, and so well informed on politics and political economy, that at first I thought myself fortunate in meeting with a man so competent to give me an unprejudiced opinion on matters of which he had been an eye-witness. At length, however, suspecting a disposition to exaggerate, and a party-feeling on the subject, I gradually led him to speak of districts with which I was already familiar, especially South Carolina and Georgia. I immediately discovered that there also he had everywhere seen the same horrors and misery. He went so far as to declare that the piny woods all around us were full of hundreds of runaways, who subsisted on venison and wild hogs; assured me that I had been deceived if I imagined that the coloured men in the upper country, where they have mingled more with the whites, were more progressive; nor was it true that the Baptists and Methodists had been successful in making proselytes. Few planters, he affirmed, had any liking for their negroes; and, lastly, that a war with England about Oregon, unprincipled as would be the measure on the part of the democratic faction, would have at least its bright side, for it might put an end to slavery. "How in the world," asked I, "could it effect this object?" "England," he replied, "would declare all the slaves in the South free, and thus cripple her enemy by promoting a servile war. The negroes would rise, and although, no doubt, there would be a great loss of life and property, the South would nevertheless be a gainer by ridding herself of this most vicious and impoverishing institution." This man had talked to me so rationally on a variety of topics so long as he was restrained by the company of Southern fellow-passengers from entering on the exciting question of slavery, that I now became extremely curious to know what business had brought him to the South, and made him a traveller there for several years. I was told by the conductor that he was "a wrecker;" and I learnt, in explanation of the term, that he was a commercial agent, and partner of a northern house which had great connexions in the South. To him had been assigned the unenviable task, in those times of bankruptcy and repudiation which followed the financial crisis of 1839–40, of seeking out and recovering bad debts, or of seeing what could be saved out of the wreck of insolvent firms or the estates of bankrupt planters. He had come, therefore, into contact with many adventurers who had been overtrading, and speculators who had grown unscrupulous, when tried by pecuniary difficulties. Every year, on revisiting the Free States, he had contrasted their progress with the condition of the South, which by comparison seemed absolutely stationary. His thoughts had been perpetually directed to the economical and moral evils of slavery, especially its injuriousness to the fortunes and characters of that class of the white aristocracy with which he had most to do. In short, he had seen what was bad in the system through the magnifying and distorting medium of his own pecuniary losses, and had imbibed a strong anti-negro feeling, which he endeavoured to conceal from himself, under the cloak of a love of freedom and progress. While he was inveighing against the cruelty of slavery, he had evidently discovered no remedy for the mischief but one, the hope of which he confessedly cherished, for he was ready to precipitate measures which would cause the Africans to suffer that fate which the aboriginal Indians have experienced throughout the Union.

When I inquired if, in reality, there were hundreds of runaway slaves in the woods, every one laughed at the idea. As a general rule, they said, the negroes are well fed, and, when they are so, will very rarely attempt to escape unless they have committed some crime: even when some punishment is hanging over them, they are more afraid of hunger than of a whipping.

Although we had now penetrated into regions where the schoolmaster has not been much abroad, we observe that the railway cars are everywhere attended by news-boys, who, in some places, are carried on a whole stage, walking up and down "the middle aisle" of the long car. Usually, however, at each station, they, and others who sell apples and biscuits, may be seen calculating the exact speed at which it is safe to jump off, and taking, with the utmost coolness, a few cents in change a moment before they know that the rate acquired by the train will be dangerous. I never witnessed an accident, but as the locomotive usually runs only fifteen miles an hour, and is some time before it reaches half that pace, the urchins are not hurried as they would be in England. One of them was calling out, in the midst of the pine-barren between Columbus and Chehaw, "A novel, by Paul le Koch, the Bulwer of France, for 25 cents — all the go! — more popular than the Wandering Jew," &c. Newspapers for a penny or two-pence are bought freely by the passengers; and, having purchased them at random wherever we went in the Northern, Middle, Southern, and Western States, I came to the conclusion that the press of the United States is quite as respectable in a moral point of view as our own. In the present crisis the greater number of prints condemn the war party, expose their motives, and do justice to the equitable offers of the English ministry in regard to Oregon. A large portion of almost every paper is devoted to literary extracts, to novels, tales, travels, and often more serious works. Some of them are specially devoted to particular religious sects, and nearly all of this class are against war. There are also some "temperance," and, in the North, "anti-slavery" papers.

We at length arrived at Montgomery, on the river Alabama, where I staid a few days to examine the geology of the neighbourhood. From the high ground near the town there is a distant view of the hills of the granitic region around Wetumpka. But the banks of the river at Montgomery are composed of enormous beds of unconsolidated gravel, thirty feet thick, alternating with red clay and sand, which I at first supposed to be tertiary, from their resemblance to strata near Macon and Augusta in Georgia. The fossil shells, however, of the accompanying marls (*Inoceramus* and *Rostellaria arenarum*), soon convinced me that they belonged to the cretaceous formation. About three miles south of the town there is a broad zone of calcareous marl, constituting what is called the prairie, or cane-brake country, bare of natural wood, and where there is so great a want of water, that it was at first difficult for settlers to establish themselves upon it, until, by aid of the Artesian auger, they obtained an abundant supply from a depth of 300, and often 500 feet, derived from the underlying gravelly and sandy beds. Farther from the outcrop of these gravelly beds borings have been made 800 feet deep without success. The temperature of the water was found to increase in proportion to the depth of the wells. A proprietor told me he had found it very difficult to get trees to grow on the prairie land, but he had succeeded, with great care, in rearing a few mulberries.

The common name for the marlite, of which this treeless soil is composed, is "rotten limestone." I found many lumps on the surface, much resembling white chalk, and containing shells of the genera, Inoceramus, Baculite, Ammonite, Hippurite, and that well-known fossil of the English chalk, *Ostrea vesicularis.*

In the market-place of Montgomery, I saw an auctioneer selling slaves, and calling out, as I passed, "Going for 300 dollars." The next day another auctioneer was selling horses in the same place. Nearly the same set of negroes, men, women, and boys, neatly dressed, were paraded there, day after day. I was glad to find that some settlers from the North, who had resided here many years, were annoyed at the publicity of this exhibition. Such traffic, they say, might as well be carried on quietly in a room. Another resident, who had come from Kentucky, was forming a party, who desire to introduce into Alabama a law, like one now in force in Kentucky, that no negroes shall henceforth be imported. By that statute, the increase of slaves has, he says, been checked. A case had lately occurred, of a dealer who tried to evade the law by bringing forty slaves into Kentucky, and narrowly escaped being fined 600 dollars for each, but had the ingenuity to get off by pretending that he was ignorant of the prohibition, and was merely passing through with them to Louisiana. "By allowing none to come in, while so many are emigrating to the West and Texas, we may hope," he said, "very soon to grow white."

Every evening, at nine o'clock, a great bell, or curfew, tolls in the market-place of Montgomery, after which no coloured man is permitted to be abroad without a pass. This custom has, I understand, continued ever since some formidable insurrections, which happened many years ago, in Virginia and elsewhere. I was glad to find that the episcopal clergyman at Montgomery had just established a Sunday school for the negroes. I also hear that a party in this church, already comprising a majority of the clergy, are desirous that the negro congregations should be represented in their triennial conventions, which would be an important step towards raising the black race to a footing of equality with the whites. In these times when many here are entertaining a hostile feeling towards Great Britain, and when the government is lending itself to the excitement, I find the ministers of the Episcopal Church peculiarly free from such a spirit, and cherishing a desire for peace and a friendly disposition towards the English. The Methodists had just been holding a protracted meeting in Montgomery, and such is the effect of sympathy and of the spirit of competition, that the religious excitement had spread to all the other sects.

CHAP. XXIII.

Voyage from Montgomery to Mobile.—Description of a large River Steamer.—Shipping of Cotton at Bluffs.—Fossils collected at Landings.—Collision of Steamer with the Boughs of Trees.—Story of a German Stewardess.—Emigration of Stephanists from Saxony.—Perpetuation of Stephanist and Mormon Doctrines.—Distinct Table for Coloured and White Passengers.—Landing at Claiborne by Torchlight.—Fossil Shells.

Wednesday, Jan. 28. 1846.—THE steamer Amaranth was lying at the bluff at Montgomery on the Alabama river, and was advertised to sail for Mobile, a navigation of more than 300 miles, at ten o'clock in the morning. From information obtained here, I had determined to follow up my geological inquiries by going next to Tuscaloosa, on the Black Warrior river, about 100 miles distant by land, in a north-westerly direction. Every one agreed, however, that it was better for me to go 800 miles by water, half of it against the stream, instead of taking the direct road; so I determined to go first to Mobile, due south, and then up the Tombeckbee to the capital of Alabama, being assured that I should gain, both in time and money, by this great detour. Should I attempt the straight road at this season, no one could ensure my making two miles an hour, so tenaciously does the marlite of the cretaceous formation, when it is wet, hold the carriage wheels which sink into it.

Accustomed to the punctuality of northern steamers, we got down with our luggage to the landing at the hour appointed, but were told they were not ready. I re-examined a good geological section in the bluff, till a friend came to me, and regretted I had come down to the boat so early, for perhaps she might not sail till the next day. I was much annoyed at this intelligence, although I had been forewarned that much less value was set on time in the Southern States than in the North. At length we went on board, and, having engaged a good private cabin, made up our minds to read and write there, and consider it as our inn. It was the first of these magnificent southern river boats we had seen, fitted up for the two-fold purpose of carrying as many bales of cotton as can be heaped upon them without their sinking, and taking in as many passengers as can enjoy the luxuries which southern manners and a hot climate require, especially spacious cabins, abundance of fresh air, and protection from the heat of the sun. We afterwards saw many larger steam-vessels, and some of them fitted up in finer style, but none which made such an impression on our minds as the Amaranth. A vessel of such dimensions makes a grand appearance in a river so narrow as the Alabama at Montgomery; whereas, if she were a third longer, she would be comparatively insignificant on the Mississippi. The principal cabins run the whole length of the ship on a deck above that on which the machinery is placed, and where the cotton is piled up. This upper deck is chiefly occupied with a handsome saloon, about 200 feet long, the ladies' cabin at one end, opening into it with folding doors. Sofas, rocking chairs, tables, and a stove are placed in this room, which is lighted by windows from above. On each side of it is a row of sleeping apartments, each communicating by one door with the saloon, while the other leads out to the guard, as they call it, a long balcony or gallery, covered with a shade or verandah, which passes round the whole boat. The second class, or deck passengers, sleep where they can on the lower floor, where besides the engine and the cotton, there are prodigious heaps of wood, which are devoured with marvellous rapidity by the furnace, and are as often restored at the different landings, a set of negroes being purposely hired for that work.

These steamers, notwithstanding their size, draw very little water, for they are constructed for rivers which rise and fall very rapidly. They cannot quite realise the boast of a Western captain, "that he could sail wherever it was damp;" but I was assured that some of them could float in two-foot water. The high-pressure steam escapes into the air, by a succession of explosions alternately from the pipes of the two engines. It is a most unearthly sound, like that of some huge monster gasping for breath; and when they clear the boilers of the sediment collected from the river-water, it is done by a loud and protracted discharge of steam, which reminded us of the frightful noise made by the steam gun exhibited at the Adelaide Gallery in London. Were it not for the power derived from the high-pressure principle, of blowing out from the boilers the deposit collected in them, the muddiness of the American rivers would soon clog the machinery. Every stranger who has heard of fatal accidents by the bursting of boilers believes, the first time he hears this tremendous noise, that it is all over with him, and is surprised to see that his companions evince no alarm. Habit soon reconciled us to the sound; and I was amused afterwards to observe that the wild birds perched on the trees which overhung the river, looked on with indifference while the paddle-wheels were splashing in the water, and the steam-pipes puffing and gasping loud enough to be heard many miles off.

After we had been on board a great part of the day, we at length got under weigh in the afternoon; but what was my surprise when I actually discovered that we were ascending the stream instead of sailing down towards Mobile. On asking the meaning of this proceeding, the mate told me, very coolly, that the captain had just heard of some cotton ready for exportation some miles above Montgomery. To this higher landing we repaired; but news being sent that a rival steam-boat was making her way up the river, the Amaranth set off down stream in good earnest, moving by aid of her powerful engines and the force of the mid-current with such velocity, that I could readily believe that 800 miles by river was shorter than 100 by land.

The pilot put into my hands a list of the landings on the Alabama river from Wetumpka to Mobile, no less than 200 of them in a distance of 434 miles. A small part only of these consisted of bluffs, or those points where the high land comes up to the river's edge—in other words, where there is no alluvial plain between the great stream and the higher country. These spots, being the only ones not liable to inundation, and which can therefore serve as inland ports when the river is full, or when the largest boats can sail up and down, are of great importance in the inland navigation of the country. A proprietor whose farm is thus advantageously situated, usually builds a warehouse, not only for storing up for embarkation the produce of his own land, but large enough to take in the cotton of his neighbours. A long and steeply-inclined plane is cut in the high bank, down which one heavy bale after another is made to slide. The negroes show great dexterity in guiding these heavy packages; but occasionally they turn over and over before reaching the deck of the boat, and sometimes, though rarely, run off the course and plunge into the river, where they float till recovered. Had I not been engaged in geological inquiries, I should probably have had my patience severely tried by such repeated stoppings at every river cliff; but it so happened that the captain always wanted to tarry at the precise points where alone any sections of the cretaceous and tertiary strata were visible, and was often obliged to wait long enough to enable me to make a tolerably extensive collection of the most characteristic fossils. In the present instance—and I shall have by-and-by to mention other similar ones—Captain Bragdon was not only courteous, but perfectly understood, and entered into my pursuits, and had himself collected organic remains for a friend in the college of Louisville, Kentucky; so that while the cotton or wood were taking on board, he would often assist me in my labours. Were it not for one serious drawback, a cruise in a cotton steamer would be the paradise of geologists. Unfortunately, in the season when the water is high, and when the facilities of locomotion are greatest, the base of every bluff is many feet, and sometimes fathoms, under water, and the lower portion of a series of horizontal strata is thus entirely concealed from view. The bluffs which I first examined consisted of a marlite divided into horizontal layers as regular as those of the lias of Europe, and which might have been taken for lias but for the included fossils, which prove them to belong to the cretaceous formation. At Centreport these unctuous marls or calcareous clays are called by the people soap-stone, and form cliffs 150 feet in perpendicular height, in which, as well as at Selma, I collected the large *Gryphœa costata* and the *Ostrea falcata,* more than one species of *Inoceramus*, and other characteristic fossil shells. At White Bluff, where the blue marlite whitens when exposed to the air, a fine range of precipices covered with wood forms a picturesque feature in the scenery; but I obtained the richest harvest of cretaceous fossils far below, at a landing called Prairie Bluff.

The banks of the Alabama, like those of the Savannah and Alatamaha rivers, are fringed with canes, over which usually towers the deciduous cypress, covered with much pendant moss. The misletoe enlivens the boughs of several trees, still out of leaf, and now and then, through an opening in the thicket bordering the river, the evergreen pine-forest appears in the back-ground. Some of the largest trees on the banks are sycamores (*Platanus occidentalis*), called button-wood, one of which I measured, and found it to be eighteen feet in circumference. The old bark is continually peeling off, and the new is as white as if the trunk of the tree had been painted.

When it was growing dusk, and nearly all had retired to their cabins, and some to their beds, we were startled by a loud crash, as if parts of the woodwork of the steamer were giving way over our heads. At the same moment a shower of broken glass came rattling down on the floor of the cabin. As I expected to land in the course of the night at Claiborne, I had not taken off my clothes, so I rushed immediately on deck, and learnt from the captain that there was no danger. I then went down to tell the passengers, especially the women, who were naturally in no small alarm, that all was safe. I found them, in great consternation, crowded together at the door of the ladies' cabin, several mothers with children in their arms. When I returned to see what had happened, a most singular and novel scene presented itself. Crash after crash of broken spars and the ringing of shattered window-glasses were still heard, and the confusion and noise were indescribable. "Don't be alarmed; we have only got among the trees," said the captain. This, I found, was no uncommon occurrence when these enormous vessels are sweeping down at full speed in the flood season. Strange as it may seem, the higher the waters rise the narrower is the river channel. It is true that the adjoining swamps and low lands are inundated far and wide; but the steamers must all pass between two rows of tall trees which adorn the opposite banks, and as the branches of these noble trees stretch half way over the stream, the boat, when the river has risen forty or sixty feet, must steer between them. In the dark, when they are going at the rate of sixteen miles an hour or more, and the bends are numerous, a slight miscalculation carries the woodwork of the great cabin in among the heads of the trees. In this predicament I found the Amaranth when I got on deck. Many a strong bough had pierced right through the cabin-windows on one side, throwing down the lights, and smashing the wooden balustrade and the roof of the long gallery, and tearing the canvas awning from the verandah. The engine had been backed, or its motion reversed, but the steamer, held fast by the trees, was swinging round with the force of the current. A large body of men were plying their axes freely, not only cutting off boughs, but treating with no respect the framework of the cabin itself. I could not help feeling thankful that no branch had obtruded itself into our berths. At length we got off, and the carpenters and glaziers set to work immediately to make repairs.

The evening before this adventure we had been sitting for some hours enjoying the privacy of our own state-room, from the windows of which we had a good view of the river's bank, when at length my wife had thought it polite to visit the ladies' cabin, as they might otherwise think her unsociable. She found there a young Irish milliner who had come out from the county of Monaghan, and was settled at Selma, one of the towns on this river, where she said she was getting on extremely well. There was also a cracker family, consisting of a squalling child and its two parents, who were "moving to the Washita river in Louisiana." The young mother was smoking a pipe, which her husband, a rough-looking backwoodsman, had politely lighted for her. As this practice was against the regulations, my wife joined the other ladies in remonstrating, and she immediately went out to smoke in the open air on the guard. I had been before amused by seeing a girl, about nine years old, employed, by way of imitating her elders, in smoking a paper cigar on the deck, and a mother, after suckling an infant of two years, give it some tobacco to chew.

Another inmate of the ladies' cabin was a German stewardess, who soon found out that my wife understood her mother tongue, and, being in great want of sympathy, poured out her tale of suffering in the New World with the simplicity of character and unreservedness of her countrywomen. Seven years ago she had been a happy and contented peasant at Chemnitz in Saxony, one of a united family of Lutherans, when she was persuaded by a priest to embrace the opinions of Martin Stephan, a preacher of Dresden, who taught that all theological study should be confined to the Bible; that literature and the fine arts, being of human origin and worldly in their nature, ought to be despised; that no one could enjoy freedom of conscience in Germany; and that the only path to salvation was to follow him, and emigrate to North America. He himself was to be their temporal and spiritual chief, and to him they were to deliver up all their property. In November, 1838, 700 victims of this impostor embarked from Bremen, including six pastors and four schoolmasters. One of the transports, the Amelia, carrying about sixty emigrants, including children, a crazy old ship, was never heard of again, and doubtless foundered on the Atlantic. The other carried Stephan and the rest of his followers to New Orleans, from whence they ascended the Mississippi, and founded a settlement, called Wittenberg, on a rich, aguish flat, bordering the Missouri, above St. Louis. Here one fourth of their number were swept off by fever, and Stephan, who had deserted a wife and nine children in Germany, was detected carrying on a licentious intercourse with some of the women of the new community. Before, however, this scandal became notorious, he contrived to make off with all the money which had been entrusted to him to buy land for the new colony. Hanne Röttgen, the young woman who related this story, went, as soon as she recovered from the ague, to St. Louis, her eyes having at length been opened, like those of many other Stephanists, to the fraud of which they had been the dupes. She was immediately employed to attend a hospital filled with numbers of her poor country people of both sexes, who had been scalded by the bursting of the boiler of a large steam-boat. After witnessing the terrible sufferings and death of not a few of these emigrants, she had engaged herself as stewardess in several vessels, and at length in the Amaranth. "But what became of Stephan?" asked my wife. "He escaped entirely," she said, "for you know, madam, there is no law in this country as there is in Saxony; but for all that, this is the land for the poor to thrive in. They pay me twenty dollars a month, and I am saving money fast; for, though home-sick, I cannot, after all my follies, return and throw myself penniless on my relations." Here she began to shed tears and to be much affected, wondering whether her mother was still alive. She had written to ask her forgiveness, as she had been her darling, and in spite of her prayers and entreaties had left her almost heart-broken. "I thought it my duty to go; for how should we poor peasants not be deceived when so many of our clergy were led astray by the cunning of that artful man? I have written to my two sisters to tell them how bitterly I repent, and to ask them to pardon me."

When I afterwards talked of this adventure in a steamer on the Mississippi, a fellow traveller exclaimed, "But would you believe it, there are still many Stephanists?" "Why not," said I, "are there not also many thousand Mormons? The fraud of Stephan was not more transparent than that of Joseph Smith or his vision, and the story he related so circumstantially of records engraven on metallic plates, shining like gold, which were delivered to him by the angel of the Lord on the 22d day of September, 1827."

Are we then to despair of the progress of the human mind in inquiries in which it must ever take the deepest interest, because in a land where there are so many schools, and so many millions of readers, a free press, and religious toleration, it is so hard to extinguish a belief in the grossest impostures? By no means — in the doctrines taught by Stephan and Smith there was a mixture of some fiction with much truth; they adopted nearly all the highest truths of theology common to the prevailing religions of the world, with the addition of nearly all which Christians believe. In each sect the difficulty consists in clearing away a greater or less amount of human error and invention from the divine truths which they obscure or conceal. The multitude are taught by their spiritual guides in three fourths of Christendom, that they are not to inquire for themselves. Even of the Protestant minority, who profess that it is their right and duty to exercise their own judgment, how many are there who annex the condition "*provided* they arrive at the conclusions to which the Church has come, without which they cannot be saved!" What more would a Stephanist or Mormon preacher ask, than the privilege of borrowing and inculcating these maxims? — and how, if the use of them be freely granted, and they have motives for perpetuating some peculiar sectarian dogmas, is the delusion ever to end?

In a Southern steamer abundant opportunities are afforded of witnessing the inconveniences arising out of the singular relation subsisting between the negroes, whether free or slave, and the white race.

The succession of breakfasts, dinners, and suppers entailed by it appears endless. In a Northern boat, after the passengers and officers of the ship have dined, the few servants who waited on them have their meal; but here we had five distinct repasts set out, one after the other. First, the cabin passengers dine; then come the white nurses, children, and officers of the ship; thirdly, the deck passengers, being white, answering to our steerage; fourthly, the white waiters, waited upon by coloured men; fifthly, coloured passengers, free or slave, and coloured waiters. It sometimes happens that a free negro who has made a good deal of money is on board; he must wait till all the white aristocracy, including the waiters, are served, and then take his turn with the lowest of the blacks. To a European this exclusiveness seems the more unnatural and offensive in the Southern States, because they make louder professions even than the Northerners of democratic principles and love of equality. I must do them the justice, however, to admit, that they are willing to carry out their principles to great lengths when the white race alone is concerned. I heard of a newly-arrived Irish ditcher at Chehaw, who was astonished when invited to sit down at table with his employer, a proprietor in the neighbourhood, who thought it necessary to recognize him as an equal. On one occasion, when I visited a lawyer at his country-house in Alabama —one accustomed to the best society of a large city, and the ladies of whose family were refined and cultivated—he felt it incumbent on him, to my great discomfiture, to invite the driver of my gig, a half-caste Indian, who travelled without any change of clothes, to sit down with us at table. He was of a dark shade, but the blood was Indian, not African, and he was therefore one of the Southern aristocracy. The man was modest and unobtrusive, and scarcely spoke; but it need scarcely be said, that his presence checked the freedom of conversation, and I was glad when his duties in the stable called him away.

In the course of the night we were informed that the Amaranth had reached Claiborne. Here we found a flight of wooden steps, like a ladder, leading up the nearly perpendicular bluff, which was 150 feet high. By the side of these steps was a framework of wood, forming the inclined plane down which the cotton bales were lowered by ropes. Captain Bragdon politely gave his arm to my wife, and two negroes preceded us with blazing torches of pine-wood, throwing their light on the bright shining leaves of several splendid magnolias which covered the steep. We were followed by a long train of negroes, each carrying some article of our baggage. Having ascended the steps, we came to a flat terrace, covered with grass, the first green sward we had seen for many weeks, and found there a small, quiet inn, where we resolved to spend some days, to make a collection of the fossil tertiary shells, so well known to geologists as abounding in the strata of this cliff. About 400 species, belonging to the Eocene formation, derived from this classic ground, have already been named, and they agree, some of them specifically, and a much greater number in their generic forms, with the fossils of the middle division of the deposits of the same age of London and Hampshire.*

The remains of the zeuglodon have been also found, by Mr. Hale, in this cliff; but, although I met with many leaves of terrestrial plants, I could neither obtain here, nor in any part of the United States, a single bone of any terrestrial quadruped, although we know that many of that class inhabited Europe at this period. That some of these may be discovered in America, I can hardly doubt; but the fact is worthy of remark, as connected with the weight due to negative evidence. When strata have been formed far from land, so as to afford few, if any, indications of land plants, we must not look for indications of air-breathing quadrupeds, nor infer their non-existence, if it be so difficult to discover them even at Claiborne, where the land, at the period of the deposition of the marine strata, cannot have been far distant.†

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* They correspond with the middle or Bracklesham series of Prestwich's triple division. See "Quart. Journ. of Geol. Soc.," vol. iii. May, 1847.

† Since writing the above, I hear that Mr. Hale, of Mobile, has met with some bones of land quadrupeds in these strata. For remarks on the strata at Claiborne, see a paper by the Author, "Quart. Journ. of Geol. Society of London," vol. iv. p. 10. June, 1848.

CHAP. XXIV.

Claiborne, Alabama.—Movers to Texas.—State Debts and Liabilities.—Lending Money to half-settled States.—Rumours of War with England.—Macon, Alabama.—Sale of Slaves.—Drunkenness in Alabama.—Laws against Duelling.—Jealousy of Wealth.—Emigration to the West.—Democratic Equality of Whites.—Skeleton of Fossil Whale or Zeuglodon.—Voyage to Mobile.

THE morning after our arrival at Claiborne, we found at the inn a family of "movers" on their way to Texas, sitting in the verandah enjoying the warm sunshine after a shower of rain. At this season, January 29th, the thermometer stood at 80° Fahrenheit in the shade, and the air was as balmy as on an English summer day. The green sward was covered with an elegant flower, the *Houstonia serpyllifolia*, different from the *H. cerulea*, so common in the New England meadows. Before the house stood a row of Pride-of-India trees (*Melia azedarach*), laden with bunches of yellow berries. I had been often told by the negroes that the American robin (*Turdus migratorius*) "got drunk" on this fruit, and we had now an opportunity of witnessing its narcotic properties; for we saw some children playing with one of these birds before the house, having caught it after it had been eating freely of the berries. My wife, seeing that the robin was in no small danger of perishing, bought it of the children for some sugar-plums, and it soon revived in our room, and flew out of the window. In the evening we enjoyed a sight of one of those glorious sunsets, the beauty of which in these latitudes is so striking, when the clouds and sky are lighted up with streaks of brilliant red, yellow, and green, which, if a painter should represent faithfully, might seem as exaggerated and gaudy as would the colours of an American forest in autumn, when compared with European woods.

The movers, who were going to Texas, had come down 200 miles from the upper country of Alabama, and were waiting for some others of their kindred who were to follow with their heavy waggons. One of these families is carrying away no less than forty negroes, and the cheerfulness with which these slaves are going they know not where with their owners, notwithstanding their usual dislike to quit the place they have been brought up in, shows a strong bond of union between the master and "his people." In the last fifteen months, 1300 whites, and twice that number of slaves, have quitted Alabama for Texas and Arkansas, and they tell me that Monroe county has lost 1500 inhabitants. "Much capital," said one of my informants, "is leaving this State, and no wonder; for if we remain here, we are reduced to the alternative of high taxes to pay the interest of money so improvidently borrowed from England, or to suffer the disgrace of repudiation, which would be doubly shameful, because the money was received in hard cash, and lent out, often rashly by the State, to farmers for agricultural improvements. Besides," he added, "all the expenses of Government were in reality defrayed during several years by borrowed money, and the burthen of the debt thrown on posterity. The facility with which your English capitalists, in 1833, lent their cash to a State from which the Indians were not yet expelled, without reflecting on the migratory nature of the white population, is astonishing! The planters who got grants of your money, and spent it, have nearly all of them moved off and settled beyond the Mississippi.

"First, our Legislature negotiates a loan; then borrows to pay the interest of it; then discovers, after some years, that five out of the sixteen millions lent to us have evaporated. Our democrats then stigmatise those who vote for direct taxes to redeem their pledges as 'the high taxation men.' Possibly the capital and interest may eventually be made good, but there is some risk at least of a suspension of payment. At this moment the State is selling land forfeited by those to whom portions of the borrowed money were lent on mortgage, but the value of property thus forced into the market, is greatly depreciated."

Although, since my departure in 1846, Alabama has not repudiated, I was struck with the warning here conveyed against lending money to a new and half-formed community, where everything is fluctuating and on the move — a State from which the Indians are only just retreating, and where few whites ever continue to reside three years in one place,—where thousands are going with their negroes to Louisiana, Texas, or Arkansas, — where even the

County Court Houses and State Capitol are on the move, the Court House of Clarke county, for example, just shifted from Clarkesville to Macon, and the seat of Legislature about to be transferred from Tuscaloosa to Montgomery. In the midst of such instability, a feeling of nationality, or State pride, cannot easily be fostered. Nevertheless, the resources, both mineral and agricultural, of so vast a territory as Alabama, a fifth larger in area than the whole of England proper, may enable them with moderate economy to overcome all their difficulties.

Often was the question put to us, "Are you moving?" But at the small tavern at Claiborne it was supposed that I might be the Methodist minister whom they were expecting to come from the North, to preach a trial sermon. Two Alabamans, who, as I afterwards learnt, were under this persuasion, were talking beside me of the chances of a war with England, and praised the British ministers for their offer of mediation. They condemned the folly of the Government at Washington for not accepting it, and agreed that the trade of Mobile would suffer seriously, if they came to blows with the English. "Calhoun," said one of them, "has pronounced in favour of peace; but they say that the Governor General of Canada is spending a mint of money on fortifications." "It is satisfactory," replied his companion, "to think that we have not yet spent a dollar on preparations; yet I doubt not, if we had to fight, that the English would get the worst of it." "Yes," said his friend, "we have whipped them twice, and should whip them a third time."

I am bound to state, that never once, where I was known to be an Englishman, were any similar speeches, uncourteous in their tone towards my country, uttered in my hearing.

On the table of the inn at Claiborne, I found a book entitled "Walsh's Appeal from the Judgment of Great Britain," in which all the provocations given to the Americans by English travellers, and the daily and periodical press of Great Britain, were brought together in one view. It is at least instructive, as showing that a disposition to run down our Transatlantic brethren was quite as marked, and perhaps even more conspicuous, before any of the States had repudiated, than after the financial crisis of 1841. So long as such an unfriendly and disparaging tone is encouraged, England does well to keep up a larger military force in Canada, and a larger navy than would otherwise be called for. It is only to be regretted that the Chancellor of the Exchequer cannot set down as a separate item, the charge for indulging in anti-American prejudices, for it is possible that John Bull, patient as he is of taxation, might doubt whether the luxury was worth its cost. When the landlord saw me making an extract from Walsh, he begged me to accept the book; the second occasion in this tour in which mine host had pressed me to take a volume out of his library, which he had seen me reading with interest.

There is a considerable uniformity in the scale of charges in country inns in the Southern States. Great hotels in large cities are more expensive, and small inns in out-of-the-way places, where there were few comforts considerably cheaper. We never made any bargains, and observed that the bill was always equitably adjusted according to the accommodation provided.

From Claiborne we crossed the Alabama river, and were hospitably received by Mr. Blount, to whom I had a letter of introduction from Mr. Hamilton Couper. While my wife stayed with Mrs. Blount at Woodlands, he took me in his carriage through the forest, to the county town of Macon, where he had business as a magistrate. Macon (Alabama) happened to lie directly in my way to Clarkesville, where I wished to examine the geology of the region where the fossil skeletons of the gigantic zeuglodon had been procured. The district we passed through was situated in the fork of the Alabama and Tombeckbee rivers, where the aboriginal forest was only broken here and there by a few clearings. To travel with an accomplished and agreeable resident proprietor who could entirely sympathise with my feelings and opinions in a district so recently deserted by the Indians, was no small advantage. When I got to Macon, my attention was forcibly called to the newness of things, by my friend's pointing out to me the ground where there had been a bloody fight with the Chocktaws and Chickasaws, and I was told how many Indians had been slaughtered there, and how the present clerk of the Circuit Court was the last survivor of those who had won the battle. The memory of General Jackson is quite idolized here. It was enough for him to give public notice in the papers that he should have great pleasure in meeting his friends at a given point on a given day, and there was sure to be a muster of several hundred settlers, armed with rifles, and prepared for a desperate fight with 5000 or 7000 Indians.

At Macon I was fortunate enough to meet with Mr. William Pickett, a friend of Mr. Blount's, who, after returning from the wars in Texas, had most actively aided Mr. Koch in digging up the skeleton of the fossil whale, or zeuglodon, near Clarkesville. As I was anxious to know the true position of that remarkable fossil, and to ascertain how much of it had been obtained in a single locality, I gladly accepted Mr. Pickett's offer, to act as guide in this excursion. On repairing to the stable for the horse destined to draw our vehicle, we were met with a singular piece of intelligence. The stable-boy who had groomed it in the morning was "up for sale." Without his assistance we could not start, for this boy had the key of the harness-room. So I determined to go to the auction, where I found that a sale of land and negroes was going on, in consequence of the State having foreclosed one of those mortgages, before alluded to, on which public money borrowed from European capitalists had been lent by the State, for agricultural improvements. I first saw an old man sold for 150 dollars; then a boy, seventeen years old, knocked down for 535 dollars, on which a bystander remarked to me, "They are selling well to-day." Next came on the young man in whose immediate release I was more especially interested. He stepped forward, hat in hand, with an easy natural air, seeming to be very indifferent to the scene around him, while the auctioneer began to describe him as a fine griff (which means three parts black), twenty-four years old, and having many superior qualities, on which he enlarged in detail. There was a sharp bidding, which lasted only a few minutes, when he was sold for 675 dollars. Mr. Pickett immediately asked him to get ready our horse, and, as he came away with us, began to joke with him, and told him "they have bid a hundred dollars more for you than I would have given;" to which he replied, very complacently, "My master, who has had the hire of me for three years, knew better than to let any one outbid him." I discovered, in short, that he had gone to the sale with a full conviction that the person whom he had been serving was determined to buy him in, so that his mind was quite at ease, and the price offered for him had made him feel well satisfied with himself.

I witnessed no mal-treatment of slaves in this State, but drunkenness prevails to such a degree among their owners, that I cannot doubt that the power they exercise must often be fearfully abused. In the morning the proprietor of the house where I lodged was intoxicated, yet taking fresh drams when I left him, and evidently thinking me somewhat unpolite when I declined to join him. In the afternoon, when I inquired at the house of a German settler, whether I could see some fossil bones discovered on his plantation, I was told that he was not at home; in fact, that he had not returned the night before, and was supposed to be lying somewhere drunk in the woods, his wife having set out in search of him in one direction, and his sister in another. In the Congress at Washington I had seen one of the representatives of this State, the worse for liquor, on his legs in the House, and I afterwards heard of his being killed in a brawl in Alabama; yet every one here speaks of the great reform which the Temperance movement has made, it being no longer an offence to decline taking a dram with your host.

When the conversation at Macon turned on duelling, I remarked to one of the lawyers, that a new bill had just been passed by the State of Mississippi, inflicting political disfranchisement as a penalty on every one concerned, whether as first or second, in a duel. He laughed, and said, "We have a similar statute here, but it is nugatory, for the forfeited rights are always restored by the Legislature, as a matter of course, if the offenders can prove that there was no unfair play in the fight." Notwithstanding this assertion, such enactments are not without their significance, and I believe that the example of New England and the progress of civilization is rapidly changing the tone of public opinion in regard to this barbarous practice. Soon after I left Macon, the news reached us of a fatal duel at Richmond, in Virginia, between two newspaper editors, one of whom, in the prime of life, and leaving a family dependent on him, was killed; and where the coroner's jury had given a verdict of murder, although the survivor was afterwards acquitted. The newspaper comments on this tragedy, even in some of the Southern States, were admirable. The following extract may be taken as an example:—"Mr. P——, a man of fifty years' experience, had been called a coward by a young man, Mr. Thomas R——. This touched his honour, which must be vindicated by putting his duty as a son, a father, a citizen, a Christian, and a man at stake. The point to be proved by being murdered, was that Tom R——'s opinion was incorrect, and that Mr. P—— was a man of honour and of courage. Mr. P—— is dead. Did his conduct prove that he was a brave or wise man? Is his reputation better, or is it worse for all this? If he could rise from the dead, and appear again in the streets of Richmond, would he be counted more a man of courage or honour, than if he had never taken the least notice of T. R—— or his opinion? Mr. R—— lives, and has his opinion still, and other people have also their opinion of him," &c.

I heard many anecdotes, when associating with small proprietors in Alabama, which convinced me that envy has a much ranker growth among the aristocratic democracy of a newly settled Slave State than in any part of New England which I visited. I can scarcely conceive the ostracism of wealth or superior attainments being carried farther. Let a gentleman who has made a fortune at the bar, in Mobile or elsewhere, settle in some retired part of the newly cleared country, his fences are pulled down, and his cattle left to stray in the woods, and various depredations committed, not by thieves, for none of his property is carried away, but by neighbours, who knowing nothing of him personally, have a vulgar jealousy of his riches, and take for granted that his pride must be great in proportion. In a recent election for Clarke county, the popular candidate admitted the upright character and high qualifications of his opponent, an old friend of his own, and simply dwelt on his riches as a sufficient ground for distrust. "A rich man," he said, "cannot sympathise with the poor." Even the anecdotes I heard, which may have been mere inventions, convinced me how intense was this feeling. One, who had for some time held a seat in the Legislature, finding himself in a new canvass deserted by many of his former supporters, observed that he had always voted strictly according to his instructions. "Do you think," answered a former partisan, "that they would vote for you, after your daughter came to the ball in them fixings?" His daughter, in fact, having been at Mobile, had had a dress made there with *flounces* according to the newest Parisian fashion, and she had thus sided, as it were, with the aristocracy of the city, setting itself up above the democracy of the pine woods. In the new settlements there the small proprietors, or farmers, are keenly jealous of thriving lawyers, merchants, and capitalists. One of the candidates for a county in Alabama confessed to me that he had thought it good policy to go everywhere on foot when soliciting votes, though he could have commanded a horse, and the distances were great. That the young lady, whose "fixings" I have alluded to, had been ambitiously in the fashion, I make no doubt; for my wife found that the cost of making up a dress at Mobile was twenty dollars, or four times the ordinary London price! The material costs about the same as in London or Paris. At

New Orleans the charge for making a gown is equally high.

I often rejoiced, in this excursion, that we had brought no servants with us from England, so strong is the prejudice here against what they term a white body-servant. Besides, it would be unreasonable to expect any one, who is not riding his own hobby, to rough it in the backwoods. In many houses I hesitated to ask for water or towels, for fear of giving offence, although the yeoman with whom I lodged for the night allowed me to pay a moderate charge for my accommodation. Nor could I venture to beg any one to rub a thick coat of mud off my boots or trousers, lest I should be thought to reflect on the members of the family, who had no idea of indulging in such refinements themselves. I could have dispensed cheerfully with milk, butter, and other such luxuries; but I felt much the want of a private bed-room. Very soon, however, I came to regard it as no small privilege to be allowed to have even a bed to myself. On one occasion, when my host had humoured my whims so far in regard to privacy, I felt almost ashamed to see, in consequence, a similar sized bed in the same room, occupied by my companion and two others. When I related these inconveniences afterwards to an Episcopal clergyman, he told me that the bishop and some of his clergy, when they travel through these woods in summer, and the lawyers, when on the circuit or canvassing for votes at elections, have, in addition to these privations, to endure the bites of countless musquitos, fleas, and bugs, so that I had great reason to congratulate myself that it was now so cold. Moreover, there are parties of emigrants in some of these woods, where women delicately brought up, accustomed to be waited on, and with infants at the breast, may now be seen on their way to Texas, camping out, although the ground within their tent is often soaked with heavy rain. "If you were here in the hot season," said another, "the exuberant growth of the creepers and briars would render many paths in the woods, through which you now pass freely, impracticable, and venomous snakes would make the forest dangerous."

Calling on a proprietor to beg him to show me some fossil bones, he finished by offering me his estate for sale at 3500 dollars. He said he had been settled there for twenty years with his wife, longer than any one else in the whole country. He had no children; and when I expressed wonder that he could leave, at his advanced age, a farm which he had reclaimed from the wilderness and improved so much, he answered, "I hope to feel more at home in Texas, for all my old neighbours have gone there, and new people have taken their place here."

The uncertainty of the cotton crops, and the sudden fluctuations in the value of cotton from year to year, have been the ruin of many, and have turned almost every landowner into a merchant and speculator. The maize, or Indian corn, appears to be almost as precarious a crop, for this year it has entirely failed in many places owing to the intense summer heat. I passed some mills in which the grain, cob, and husk were all ground up together for the cattle and hogs, and they are said to thrive more on this mixture than on the grain alone.

The different stages of civilisation to which families have attained, who live here on terms of the strictest equality, is often amusing to a stranger, but must be intolerable to some of those settlers who have been driven by their losses from the more advanced districts of Virginia and South Carolina, having to begin the world again. Sometimes, in the morning, my host would be of the humblest class of "crackers," or some low, illiterate German or Irish emigrants, the wife sitting with a pipe in her mouth, doing no work and reading no books. In the evening, I came to a neighbour, whose library was well stored with works of French and English authors, and whose first question to me was, "Pray tell me, who do you really think is the author of the Vestiges of Creation?" If it is difficult in Europe, in the country far from towns, to select society on a principle of congeniality of taste and feeling, the reader may conceive what must be the control of geographical circumstances here, exaggerated by ultra-democratic notions of equality and the pride of race. Nevertheless, these regions will probably bear no unfavourable comparison with such parts of our colonies, in Canada, the Cape, or Australia, as have been settled for an equally short term of years, and I am bound to say, that I passed my time agreeably and profitably in Alabama, for every one, as I have usually found in newly peopled districts, was hospitable and obliging to a stranger. Instead of the ignorant wonder, very commonly expressed in out-of-the-way districts of England, France, or Italy, at travellers who devote money and time to a search for fossil bones and shells, each planter seemed to vie with another in his anxiety to give me information in regard to the precise spots where organic remains had been discovered. Many were curious to learn my opinion as to the kind of animal to which the huge vertebræ, against which their ploughs sometimes strike, may have belonged. The magnitude, indeed, and solidity of these relics of the colossal zeuglodon, are such as might well excite the astonishment of the most indifferent. Dr. Buckley informed me, that on the estate of Judge Creagh, which I visited, he had assisted in digging out one skeleton, where the vertebral column, almost unbroken, extended to the length of seventy feet, and Dr. Emmons afterwards showed me the greater part of this skeleton in the Museum of Albany, New York. On the same plantation, part of another backbone, fifty feet long, was dug up, and a third was met with at no great distance. Before I left Alabama, I had obtained evidence of so many localities of similar fossils, chiefly between Macon and Clarkesville, a distance of ten miles, that I concluded they must have belonged to at least forty distinct individuals.

I visited, with Mr. Pickett, the exact spot where he and Mr. Koch disinterred a portion of the skeleton afterwards exhibited in New York under the name of Hydrarchos, or "the Water-king." The bones were imbedded in a calcareous marly stratum of the Eocene formation, and I observed in it many casts of the chambers of a large nautilus, which were at first mistaken by Koch for the paddles of the huge animal. Portions of the vertebral column, exhibited by him, in 1845, at New York and Boston, were procured in Washington county, fifteen miles distant in a direct line from this place, where the head was discovered.* Some single vertebræ, which I found here, were so huge and so impregnated with carbonate of lime, that I could not lift them from the ground without an effort. Professor Jeffries Wyman was the first who clearly pointed out that the bones, of which the factitious skeleton called Hydrarchos was made up, must have belonged to different individuals, and to a mammal. They were in different stages of ossification, he said, some adult, others immature, a state of things never combined in one and the same individual. Mr. Owen had previously maintained, that the animal was not reptilian, but cetacean, because each tooth was furnished with double roots, implanted in corresponding double sockets. After my return from America, a nearly entire skull of the zeuglodon was found by Mr. S. F. Holmes and Professor L. R. Gibbes, of Charleston, S. C., and it was found to have the double occipital condyles, only met with in mammals, and the convoluted tympanic bones which are characteristic of cetaceans, so that the real nature of this remarkable extinct species of the whale tribe has now been placed beyond all doubt.

Feb. 5. — On my return from this excursion,

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* See "American Journ. of Science," New Series, vol. i. p. 312.

I rejoined my wife at Mr. Blount's, and we then went back to the inn at Claiborne to wait for a steamer bound for Mobile. The first large vessel which touched for a moment at the landing, came up the river from that city, and stopped to know if there were any passengers. The answer was, "No, what news?" To which they replied, "Cotton up one eighth—no war." They were off in an instant, and a few hours later, when it was dark, another large vessel was hailed coming down stream. We were glad to find that it was the Amaranth, commanded by our old friend Captain Bragdon, who had sailed up and down, more than 800 miles, in the interval since we saw him. Once more we descended the steep cliff, on the slope of which we had spent many pleasant hours, gathering hundreds of beautifully preserved shells, and saw it illuminated by a blaze of torch-light.

Between Claiborne and Mobile, there are about 100 miles of river navigation, our course being nearly due south. About half way, we passed, in the night, the junction of the Tombeckbee and Alabama rivers, and, in the morning, saw in all directions a low flat country, which continued till we reached the metropolis of Alabama.

CHAP. XXV.

Voyage from Mobile to Tuscaloosa. — Visit to the Coal-Field of Alabama. — Its Agreement in Age with the ancient Coal of Europe. — Absenteeism in Southern States. — Progress of Negroes. — Unthriftiness of Slave-Labour. — University of Tuscaloosa. —Churches. — Bankruptcies. — Judges and Law Courts. — Geology on the Tombeckbee River. — Artesian Wells. — Limestone Bluff of St. Stephen's. — Negro shot by Overseer. — Involuntary Efforts of the Whites to civilize the Negroes. — New Statute in Georgia against Black Mechanics. — The Effects of speedy Emancipation and the free Competition of White and Black Labourers considered.

Feb. 8. 1846. — The Tuscaloosa steamer was just ready to sail the next morning from Mobile, up the great western tributary of the Alabama, called the Tombeckbee (or more familiarly "the Bigby"); I determined, therefore, to embark in her for the capital of the State, about 400 miles distant by water to the north, where I wished to explore the coal-field in which the coal used for gas and fuel at Mobile is procured, and to ascertain its geological age. Our steamer was 170 feet long, and made about ten miles an hour against the stream. She carried stores of all kinds to the upper country, but was not heavily laden; and, on her return, is to bring down a large freight of cotton. By means of the high pressure principle and the horizontal movement of the piston, she draws only a few feet water, notwithstanding her great length. These steamers never appear to such advantage as when stemming an adverse current, for the boat can then be steered with more precision, and less time is lost at the landings; at each of these they can go up direct to the bank, whereas, in descending, they have to turn round and reascend the stream before they can stop. There were also rafts laden with huge piles of wood ready to be taken in tow at different points, the logs being thrown on board by our negroes, while the steamer was going on at full speed. The empty raft is then turned adrift, and is easily piloted down stream by two men, a manœuvre which could not be practised when vessels are going in the opposite direction. All the chairs in the cabin of the Tuscaloosa were so constructed as to be capable of floating, and acting as life-preservers — a useful precaution on a river, whatever may be thought of such safe-guards in an ocean steamer.

The river Tombeckbee was so high that the trees of both banks seemed to be growing in a lake. Before dark, we came to the limestone bluff at St. Stephen's, more than sixty miles due north of Mobile, and nearly 150 miles by the windings of the river. The tide is still slightly perceptible, even at this distance from the sea, and the water never rises during a flood more than five or six feet above its ordinary level; whereas, higher up, at Demopolis, the extreme rise is not less than fifty feet, and at Tuscaloosa, sixty-nine feet. At the latter place, indeed, we found the waters so high, that the falls were converted into mere rapids. The magnificent scale of the navigation on these southern rivers in the rainy season, contrasts remarkably with the want of similar facilities of water communication in Texas and the more western countries bordering the Gulf of Mexico. We admired the canes on the borders of the river between Tuscaloosa and Demopolis, some of which I found to be thirty feet high. Whether this magnificent reed, which is said sometimes to grow forty feet high, is a distinct species, or merely a variety of *Miegia macrosperma,* which I had seen from six to ten feet high, as far north as Kentucky and North Carolina, botanists are not yet agreed.

Tuscaloosa is situated, like Augusta, Milledgeville, and Columbus, at the falls of a river, though, in this instance, the falls do not occur, as usual at the junction of the granitic rocks, with the tertiary or cretaceous strata, but at the point where the latter first meet the carboniferous formation. The lower beds of the horizontal cretaceous series in contact with the inclined coal-measures, consist of gravel, some of the quartzose pebbles being as large as hen's eggs, and they look like an ancient beach, as if the cretaceous sea had terminated here, or shingle had been accumulated near a shore.

There is a flourishing college at Tuscaloosa, standing upon a hill 450 feet above the level of the sea. Here I was welcomed by the professor of chemistry, Mr. Brumby, who had the kindness to set out immediately with me (Feb. 10.) to examine the coal-fields lying immediately north of this place. Starting in a north-easterly direction, we first entered a hilly country formed of sandstone, grit, and shale of the coal formation, precisely like the strata in which coal occurs in England. These hills were covered with long-leaved pines, and the large proportion they bear to the hard wood is said to have been increased by the Indian practice of burning the grass; the bark of the oak and other kinds of hard wood being more combustible, and more easily injured by fire, than that of the fir tribe. Everywhere the young seedlings of the long-leaved pine were coming up in such numbers, that one might have supposed the ground to have been sown with them; and I was reminded how rarely we see similar self-sown firs in English plantations. When we had gone about twenty miles north-east of Tuscaloosa, we came to a higher country, where nearly all the pines disappeared, and were replaced by oak, hiccory, sumach, gum trees, sassafras, and many others. In some clearings here, as in Georgia and the Carolinas, the quantity or cordage of wood fit for charcoal produced in thirty years by the new growth, is said, from its greater density, to have equalled the wood contained in the aboriginal forest.

Near the banks of the Black Warrior river, we examined several open quarries of coal, where the edges of the beds had been dug into by different proprietors, no regular mining operations having as yet been attempted. Even at the outcrop the coal is of excellent quality, and highly bituminous, and I soon satisfied myself that the strata were not of the age of the Richmond coal before described*, but were as ancient as that of the Alleghany Hills, or of

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* Ante, vol. i. p. 283.

Western Virginia. In the beds of black shale covering each coal-seam, were impressions of fossil plants, precisely similar to those occurring in the ancient coal-measures of Europe and America. Among these we found more than one species of *Calamite*, several ferns of the genera *Sphenopteris* and *Neuropteris*, the trunks of *Lepidodendron* and *Sigillaria*, the stems and leaves of *Asterophyllite*, and in other beds the characteristic root called *Stigmaria*, not uncommon.*

According to Professor Brumby, this coal-field of the Warrior River is ninety miles long from north to south, and from ten to thirty miles in breadth, and includes in it some coal-seams not less than ten feet thick. It forms a southern prolongation of the great Appalachian coal-field, with which I was unacquainted when I compiled my map, published in 1845, of the geology of North America.† Its geographical situation is peculiarly interesting; for, being situated in lat. 33° 10′ north, it constitutes at present the extreme southern limit to which the ancient carboniferous vegetation has been traced in the northern hemisphere, whether on the east or west side of the Atlantic.

Continuing our route into the upland country, we entered, about thirty-three miles N. E. of Tuscaloosa, a region called Rook's Valley, where rich beds of ironstone and limestone bid fair, from their proximity to the coal, to become one day a source of great mineral wealth. At present the country has been suffered to retrograde, and the population to grow less numerous than it was twenty years ago, owing to migrations to Louisiana and Texas, and partly to the unthriftiness of slave-labour.

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* See "Quart Journ. of Geol. Soc.," vol. ii. p. 278., and for a list of the plants, by Mr. C. J. F. Bunbury, p. 282. ibid.

† See "Travels," &c., vol. ii.

We travelled in a carriage with two horses, and could advance but a few miles a day, so execrable and often dangerous was the state of the roads. Occasionally we had to get out and call at a farm-house to ask the proprietor's leave to take down his snake-fence, to avoid a deep mud-hole in the road. Our vehicle was then driven over a stubble field of Indian corn, at the end of which we made our exit, some fifty yards on, by pulling down another part of the fence. In both places the labour of rebuilding the fence, which consists simply of poles loosely placed together, and not nailed, was entailed upon us, and caused no small delay.

One of the evils, tending greatly to retard the progress of the Southern States, is absenteeism, which is scarcely known in the North. The cheapness of land, caused by such rapid emigration to the South and West, and the frequent sales of the estates of insolvents, tempts planters to buy more land than they can manage themselves, which they must therefore give in charge to overseers. Accordingly, much of the property in Alabama belongs to rich Carolinians, and some wealthy slave-owners of Alabama have estates in Mississippi. With a view of checking the increase of these "pluralities," a tax has recently been imposed on absentees. In Alabama, as in Georgia, I found that the coloured people were more intelligent in the upper country, and I listened with satisfaction to complaints of their setting themselves up, and being less content than formerly with their lot. That men of colour can sometimes make large fortunes in trade, was proved to me by a fact which came accidentally to my knowledge. One of them, by standing security for a white man, had lately lost no less than 17,000 dollars, or 3400 guineas; yet he was still prospering, and kept a store, and, being a free man, would willingly have sent his son to the college of Tuscaloosa, had he not been prevented by the prejudices of a white aristocracy, ostentatiously boastful of its love of equality. In consequence of similar impediments, many thriving artisans of the coloured race remain uneducated, and are obliged to have white men to write for them and collect their debts; and I found that many cabinet-makers, carpenters, builders, and other mechanics earning high wages, who, in New England, would send their sons to college, do not contribute here even to the maintenance of common schools, their children not being permitted by law to learn to read and write. I cannot believe, however, that this state of things can endure many years, for I found that an excellent sabbath school had been established by the Presbyterians in Tuscaloosa, for the children of negroes. There are two coloured men in this town, who, having a dash of Indian as well as negro blood in their veins, have become the owners of slaves.

Frequent mention was made during our stay in Alabama, of a negro named Ellis, a blacksmith, who had taught himself Greek and Latin. He is now acquiring Hebrew, and I was sorry to hear that the Presbyterians contemplate sending him as a missionary to Liberia. If it were an object in the South to elevate the blacks, he might be far more instrumental in forwarding the cause of civilisation and Christianity by remaining at home, for the negroes like a preacher of their own race.

The coloured domestic servants are treated with great indulgence at Tuscaloosa. One day some of them gave a supper to a large party of their friends in the house of a family which we visited, and they feasted their guests on roast turkeys, ice-creams, jellies, and cakes. Turkeys here cost only seventy-five cents, or about three shillings the couple, prepared for the table; the price of a wild turkey, an excellent bird, is twenty-five cents, or one shilling. After calculating the interest of the money laid out in the purchase of the slaves, and the price of their food, a lawyer undertook to show me that a negro cost less than an English servant; "but, as two blacks do the work of only one white, it is a mere delusion," he said, "to imagine that their labour is not dearer." It is usual, moreover, not to exact the whole of their time for domestic duties. I found a footman, for example, working on his own account as a bootmaker at spare hours, and another getting perquisites by blacking the student's shoes.

That slave labour is more expensive than free, is an opinion which is certainly gaining ground in the higher parts of Alabama, and is now professed openly by some Northerners who have settled there. One of them said to me, "Half the population of the South is employed in seeing that the other half do their work, and they who do work, accomplish half what they might do under a better system." "We cannot," said another, "raise capital enough for new cotton factories, because all our savings go to buy negroes, or, as has lately happened, to feed them, when the crop is deficient." A white bricklayer had lately gone from Tuscaloosa to serve an apprenticeship in his trade at Boston. He had been earning there 2½ dollars a day, by laying 3000 bricks daily. A Southern planter, who had previously been exceedingly boastful and proud of the strength of one of his negroes (who could, in fact, carry a much greater weight than this same white bricklayer), was at first incredulous when he heard of this feat, for his pattern slave could not lay more than 1000 bricks a day.

During my absence on the geological excursion above mentioned, through forests recently abandoned by the Indians, and where their paths may still be traced, I found that my wife had made many agreeable acquaintances at Tuscaloosa. Two of the ladies she had seen (New Englanders, who had married Southerners), were reading the works of Schiller and Goethe in the original for their amusement. My companion, the Professor of Chemistry, was not the only one from whom I obtained much scientific information, and we enjoyed the pleasure, one clear night, of looking through a telescope recently sent from London, and were shown by Mr. Barnard, the teacher of astronomy, some double stars and southern constellations not visible in England.

The annual expense of a student in the University is 300 dollars, or sixty guineas a year, including board. A gentleman, whose family consisted of eight individuals, with eight negro servants, told me that he could not live respectably for less than 1700 dollars a year (340 guineas). Yet he paid no less than 40 dollars, or eight guineas, a year, for a pew in the Presbyterian church, holding six persons, which will give some idea of the liberal support afforded, under the voluntary system, to the ministers of religion. Among the professers here, there are Baptists, Presbyterians, Episcopalians, and I was told of one that he was not a member of any church, but a regular attendant at the Baptist or Presbyterian meeting. On Sunday, we heard the Bishop of Alabama preach, the congregation here being reckoned the second in the State. The first is at Mobile, and there are about ten in all. The service was read by another clergyman, as, according to the usual custom in America, there was no clerk, the Bishop read the responses and gave out the psalms, seeming to us, at first, to be performing the office of clerk. It often struck me as an advantage in the United States, that the responses are never read by an illiterate man, as happens not uncommonly in our country parishes, and the congregation joins in the service more earnestly when the part which properly belongs to them does not devolve on a regular functionary. A few days later, when I was on my way, in a steamer, to Mobile, I conversed with an Episcopal clergyman, a high churchman, whose profession I had recognised by the strictness of his costume. He told me he meant to visit England, and, with that view, had for some months abstained entirely from the chewing of tobacco, having been told it would be considered a breach of good manners there. His physician, also, had assured him, that this habit, which he had taken pains to acquire when a boy, because he thought it manly, though much against his natural taste, was injuring his health. He seemed to know the names of almost every bishop and dignitary of the English Church, their incomes and shades of opinion, and regretted that Archbishop Whately had taken such low ground in regard to the apostolic succession. "The bishop of this diocese," he said, "receives about 800*l.* a year, and has to pay his own travelling expenses, but in the older States the bishops have higher salaries." Episcopal clergymen usually receive about 500 dollars (or 100 guineas) in country parishes, and four times that sum in large towns, or even more. Upon the whole, he thought them well paid, in proportion to the average scale of fortunes in the United States, and he was convinced, that as the wealthiest class are so often Episcopalians, his church is a gainer in worldly advantages as well as spiritual influence, by being wholly unconnected with the State.

In the afternoon, the Presbyterian minister of Tuscaloosa delivered a good discourse on the necessity of a higher standard of honour in commercial affairs. Channing had said, that they who become insolvent by over-trading, often inflict more misery than highwaymen and thieves; and this preacher affirmed that for each hundred persons engaged in trade in Alabama, there had been ninety-seven bankruptcies. One of the citizens, who was scandalised at this assertion, afterwards raised the question, whether it was true, and I asked if any one of the party could name a tradesman in their town who had not failed once in the last twenty years. They were only able to mention two.

I was surprised at the number of lawyers at Tuscaloosa who enjoyed the title of Judge, and equally amused when the cause was explained to me. False notions of economy have from time to time induced the democracy to lower the salaries of the judges, especially in the inferior courts. The consequence has been, that as the State can no longer command the services of the best lawyers, the bench has grown weaker than the bar, and the authority of judicial decisions has been impaired. Hence the increased number of appeals to the Supreme Court of the State now sitting at Tuscaloosa. Yet, in spite of this augmentation of business, the income of the judges in this court also has been lowered from 3000 to 2500 dollars; although lawyers in good practice in Mobile have been known to make 10,000 or 14,000 dollars a year. It is by no means uncommon, therefore, for one who has a large family, to give up the bench and return to the bar; but, in that case, the title of Judge is still given to him by courtesy, and is much prized, especially by northern men, who are willing to make a sacrifice for this honour by serving a few years on the bench and then retiring from it.

I have before alluded to the deep ravines recently cut through incoherent strata in Georgia, after the natural wood has been felled.* One of these modern gullies may now be seen intersecting most inconveniently the main street of Tuscaloosa, and several torrents are cutting their way backwards through the "cretaceous" clay, sand, and gravel of the hill on which the Capitol stands. They even threaten in a few years to undermine that edifice. I had observed other recent ravines, from seventy to eighty feet deep, in the Eocene strata between Macon and Clarkesville (Alabama), where the forest had been felled a few years before.

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* Ante, p. 25.

On my way back from Tuscaloosa to Mobile, I had a good opportunity of examining the geological structure of the country, seeing various sections, first of the cretaceous, and then lower down of the tertiary strata. The great beds of gravel and sand above alluded to, forming the inferior part of the cretaceous series, might from their want of consolidation be mistaken for much newer deposits, if their position on the Tombeckbee, as well as on the Alabama river at Montgomery, were not perfectly clear. They pass beneath the great marlite formation, full of cretaceous shells, which gives rise to the prairie soils before described*, as nearly destitute of natural wood, and crossing Alabama in an east and west direction. These I examined at Erie, at Demopolis, and at Arcola, where they contain hippurites and other characteristic fossils. The depth to which they have sunk Artesian wells through them in many places (between 500 and 1,000 feet) is astonishing. One boring through blue marl and limestone at Erie, in

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* Ante, p. 42.

Greene county, was 469 feet deep, and the well yielded 350 gallons of water per minute at the surface. The water rises forty feet above the surface, and can be made to reach fifty feet, though in diminished quantity. Here, as in Europe, the temperature of the earth's crust is found to increase as we descend, the water being sensibly warmer than that of the air, so much so that in cold weather it sends forth steam. Each new excavation at Erie robs the wells previously bored of part of their supply. The augur with which they perforate the soil is four inches in diameter, and the average cost of excavation sixty-two cents, or about 2*s.* 6*d.* per foot, for the whole depth of 469 feet. No solid rock has been pierced here, the strata consisting throughout of soft horizontally stratified blue limestone. They have also pierced these same rocks, at a distance of three miles from Demopolis (a town situated at the junction of the Tombeckbee and Black Warrior rivers), to the depth of 930 feet without gaining the water, yet they do not despair of success, as sand has just been reached.

At Arcola, the proprietor presented me with several cretaceous fossils, and some irregular tubular bodies, the origin of which he wished to have explained. I immediately recognised them as identical with the vitreous tubes found at Drigg, in Cumberland, in hills of shifting sand, which have been described and figured in the Transactions of the Geological Society of London.* They have a glazed and vitrified interior, and bodies of similar form and structure were first supposed by Saussure to have been due to the passage of lightning through sand, a theory now generally adopted.

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* Vol. ii. p. 528. and vol. v. p. 617., 1st series.

If any geologist retains to this day the doctrine once so popular, that at remote periods marine deposits of contemporaneous origin were formed everywhere throughout the globe with the same mineral characters, he would do well to compare the succession of rocks on the Alabama river with those of the same date in England. If there were no fossils, he might suppose the Lower cretaceous beds of loose gravel to be the newest tertiary, the main body of the chalk to be lias, and the soft limestone of St. Stephen's, which is tertiary, to be the representative of chalk. When I arrived at the last-mentioned rock, or the white calcareous bluff of St. Stephen's, it was quite dark, but Captain Lavargy, who commanded the vessel, was determined I should not be disappointed. He therefore said he would stop and take in a supply of wood at the place, and gave me a boat, with two negroes amply provided with torches of pine-wood, which gave so much light that I was able to explore the cliff from one end to the other, and to collect many fossils. The bluff was more than 100 feet high, and in parts formed of an aggregate of corals resembling nummulites, but called, by A. D'Orbigny, orbitoides.

I had seen the same "orbitoidal" limestone in the interior of Clarke county, forming knolls, on which many cedars or junipers were growing, reminding me greatly of parts of the English South Downs, covered with yew trees or juniper, where the pure calcareous soil of the chalk reaches the surface.

When I looked down from the top of the precipice at St. Stephen's, the scene which presented itself was most picturesque. Near us was the great steam-boat, throwing off a dense column of white vapour, and an active body of negroes throwing logs on board by torch-light. One of my companions had clambered with me, torch in hand, to the top of the bluff; the other was amusing himself in the boat below by holding another blazing torch under large festoons of Spanish moss, which hung from the boughs of a huge plane tree. These mossy streamers had at length been so dried up by the heat, that they took fire, and added to the brilliant illumination. My fellow passengers were asleep during this transaction, but congratulated me the next morning on having had the command of the vessel during the night.

On board the steamer were three gentlemen of respectable families and good standing in society, who had been ruined by their drunken habits. They had all been brought up to the bar, and two of them were married. One had become quite imbecile; and I saw the captain and clerk interfere to prevent him from taking more spirits. We heard many lamentations at the prevalence of this vice in Alabama, and were told of a skilful physician who had lost all his practice by giving way to intemperance. While one of the passengers was conversing with me on this subject, he called my attention to an overseer just coming on board, who, not long ago, had shot a negro, a ringleader in a conspiracy. The affair, he said, had not reached a desperate point, and might have been better managed, had he not been a passionate man. I was going to express my indignation at the idea of such an agent continuing to be entrusted with power, when I saw him approaching us. His countenance was by no means prepossessing, and I involuntarily withdrew. To my surprise, my companion, whose general opinions had pleased me much, greeted and shook hands with his acquaintance with apparent cordiality.

This adventure, and my meeting with the slave-stealer on board the "General Clinch," before related*, where the two cases which most shocked my feelings in the course of my present tour in Georgia and Alabama. To inquire into the condition of the negroes, and the evils arising out of the relation of master and slave, was not the object of my visit; but when I afterwards related to an Abolitionist in Massachusetts, how little actual suffering had obtruded itself on my notice, he told me that great pains must have been taken by the planters to conceal from me the true state of things, while they had taken care to propitiate me by hospitable attentions. I was glad, however, to find my experience borne out by that of a Scotch weaver, William Thomson, of Stonehaven, who travelled in the year 1841–42 for his health in the Southern States. He supported himself as he went along by manual labour, and lived on intimate terms with persons of a different class of society from those with whom I had most intercourse.

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* Ante, vol. i. p. 309.

On his return home he published a small book, in which he says, "It will appear, to those who knew my opinions on slavery before I visited America, that, like most others who can judge dispassionately, I have changed my opinion considerably." He gives a detailed account of his adventures in the regions which I traversed in Alabama, Georgia, and many other States, and concludes by observing,—"After witnessing negro slavery in mostly all the slave-holding States,—having lived for weeks in cotton plantations, observing closely the actual condition of the negroes,—I can assert, without fear of contradiction from any man who has any knowledge of the subject, that I have never witnessed one-fifth of the real suffering that I have seen in manufacturing establishments in Great Britain." In reference to another topic, he affirms "that the members of the same family of negroes are not so much scattered as are those of working men in Scotland, whose necessities compel them to separate at an age when the American slave is running about gathering health and strength."*

I am aware that there is some danger, when one hears the philanthropist declaiming in terms of gross exaggeration on the horrors of slavery and the crimes of the planters, of being tempted by a spirit of contradiction, or rather by a love of justice, to counteract misrepresentation, by taking too favourable a view of the condition and prospects of the negroes. But there is another reason, also, which causes the traveller in the South to moderate his enthusiasm for emancipation. He is forced continually to think of the responsibility which would be incurred, if several millions of human beings were hastily set aside, like so many machines, by withdrawing from them suddenly the protection afforded by their present monopoly of labour. In the opening of the market freely to white competitors, before the race is more improved, consists their danger.

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* Tradesman's Travels in the United States, &c., in the years 1840—42, p. 182.

Yet, on taking a near view of the slave question, we are often thrown into opposite states of mind and feeling according as the interests of the white or negro race happen, for the moment, to claim our sympathy. It is useless now to look back and wish, for the sake of civilisation, that no Africans had ever crossed the Atlantic. Their number in the Union now exceeds three millions, and, as they have doubled in the last twenty-five years, we must expect, unless some plan can be devised to check their increase, that they will amount, before the close of this century, to twelve millions, by which time the white population will have augmented to eighty millions. Notwithstanding this increase of negroes, were it not for disturbing causes, to which I shall presently advert, I should cherish the most sanguine hopes of their future improvement and emancipation, and even their ultimate amalgamation and fusion with the whites, so highly has my estimate of their moral and intellectual capabilities been raised by what I have lately seen in Georgia and Alabama. Were it not for impediments which white competition and political ascendancy threaten to throw in the way of negro progress, the grand experiment might be fairly tried, of civilising several millions of blacks, not by philanthropists, but by a steadier and surer agency—the involuntary efforts of several millions of whites. In spite of prejudice and fear, and in defiance of stringent laws enacted against education, three millions of a more enlightened and progressive race are brought into contact with an equal number of labourers lately in a savage state, and taken from a continent where the natives have proved themselves, for many thousand years, to be singularly unprogressive. Already their task-masters have taught them to speak, with more or less accuracy, one of the noblest of languages, to shake off many old superstitions, to acquire higher ideas of morality, and habits of neatness and cleanliness, and have converted thousands of them to Christianity. Many they have emancipated, and the rest are gradually approaching to the condition of the ancient serfs of Europe half a century or more before their bondage died out.

All this has been done at an enormous sacrifice of time and money, an expense, indeed, which all the governments of Europe and all the Christian missionaries, whether Romanist or Protestant, could never have effected in five centuries. Even in the few States which I have already visited since I crossed the Potomac, several hundred thousand whites of all ages, among whom the children are playing by no means the least effective part, are devoting themselves with greater or less activity to these involuntary educational exertions.

It had previously been imagined that an impassable gulf separated the two races; but now it is proved that more than half that space can, in a few generations, be successfully passed over, and the humble negro of the coast of Guinea has shown himself to be one of the most imitative and improvable of human beings. Yet the experiment may still be defeated, not so much by the fanaticism of abolitionists, or the prejudices of those slave-owners who are called perpetualists, who maintain that slavery should be permanent, and that it is a blessing in itself to the negro, but by the jealousy of an unscrupulous democracy invested with political power. Of the imminent nature of this peril, I was never fully aware, until I was startled by the publication of an act passed by the Legislature of Georgia during my visit to that State, December 27, 1845. The following is the preamble and one of the clauses:—

"An Act to prohibit coloured mechanics and masons, being slaves, or free persons of colour, being mechanics or masons, from making contracts for the erection of buildings, or for the repair of buildings, and declaring the white person or persons directly or indirectly contracting with or employing them, as well as the master, employer, manager, or agent for said slave, or guardian for said free person of colour, authorising or permitting the same, guilty of a misdemeanor," and prescribing punishment for the violation of this act.

"Section 1.—Be it enacted by the Senate and House of Representatives of the State of Georgia in General Assembly met, and it is hereby enacted by the authority of the same, That from and after the 1st day of February next, each and every white person who shall hereafter contract or bargain with any slave, mechanic, or mason, or free person of colour, being a mechanic or mason, shall be liable to be indicted for a misdemeanor; and, on conviction, to be fined, at the discretion of the Court, not exceeding two hundred dollars."

Then follows another clause imposing the like penalties on the owners of slaves, or guardians of *free persons of colour,* who authorise the contracts prohibited by this statute.

I may first observe, in regard to this disgraceful law, which was only carried by a small majority in the Georgian Legislature, that it proves that not a few of the negro race have got on so well in the world in reputation and fortune, and in skill in certain arts, that it was worth while to legislate against them in order to keep them down, and prevent them from entering into successful rivalry with the whites. It confirms, therefore, most fully the impression which all I saw in Georgia had left on my mind, that the blacks are steadily rising in social importance in spite of slavery; or, to speak more correctly, by aid of that institution, assuming, as it does, in proportion as the whites become civilised, a more and more mitigated form. In the next place I shall endeavour to explain to the English reader the real meaning of so extraordinary a decree. Mr. R. H. Wilde, formerly senator for Georgia, told me that he once knew a coloured freeman who had been brought up as a saddler, and was a good workman. To his surprise he found him one day at Saratoga, in the State of New York, acting as servant at an hotel. "Could you not get higher wages," he inquired, "as a saddler?" "Yes," answered he; "but no sooner was I engaged by a 'boss,' than all the other workmen quitted." They did so, not because he was a slave, for he had long been emancipated, but because he was a negro. It is evident, therefore, that it requires in Georgia the force of a positive statute to deprive the negro, whether he be a freeman or slave, of those advantages from which, in a free State like New York, he is excluded, without any legislative interference.

I have heard apologists in the North endeavouring to account for the degraded position which the negroes hold, socially and politically, in the Free States, by saying they belong to a race which is kept in a state of slavery in the South. But, if they really desired to accelerate emancipation, they would begin by setting an example to the Southern States, and treating the black race with more respect and more on a footing of equality. I once heard some Irish workmen complain in New York, "that the niggers shut them out from all the easiest ways of getting a livelihood;" and many white mechanics, who had emigrated from the North to the Slave States, declared to me that every opening in their trades was closed to them, because black artisans were employed by their owners in preference. Hence, they are now using in Georgia the power given to them by an exclusive franchise, to pass disabling statutes against the blacks, to prevent them from engaging in certain kinds of work. In several States, Virginia among others, I heard of strikes, where the white workmen bound themselves not to return to their employment until the master had discharged all his coloured people. Such combinations will, no doubt, forward the substitution of white for negro labour, and may hasten the era of general emancipation. But if this measure be prematurely adopted, the negroes are a doomed race, and already their situation is most critical. I found a deep conviction prevailing in the minds of experienced slave-owners, of the injury which threatened them; and more than once, in Kentucky and elsewhere, in answer to my suggestions, that the time for introducing free labour had come, they said, "I think so; we must *get rid* of the negroes." "Do you not think," said I, "if you could send them all away, that some parts of the country would be depopulated, seeing how unhealthy the low grounds are for the whites?" "Perhaps so," replied one planter, "but other regions would become more productive by way of compensation; the insalubrity of the Pontine marshes would be no excuse for negro slavery in Italy. All might end well," he added, "were it not that so many anti-slavery men in the North are as precipitate and impatient as if they believed, like the Millerites, that the world was coming to an end."

One of the most reasonable advocates of immediate emancipation whom I met with in the North, said to me, "You are like many of our politicians, who can look on one side only of a great question. Grant the possibility of these three millions of coloured people or even twelve millions of them fifty years hence, being capable of amalgamating with the whites, such a result might be to you perhaps, as a philanthropist or physiologist, a very interesting experiment; but would not the progress of the whites be retarded, and our race deteriorated, nearly in the same proportion as the negroes would gain? Why not consider the interests of the white race by hastening the abolition of slavery. The whites constitute nearly six-sevenths of our whole population. As a philanthropist, you are bound to look to the greatest good of the two races collectively, or the advantage of the whole population of the Union."

CHAP. XXVI.

Return to Mobile. — Excursion to the Shores of the Gulf of Mexico. — View from Lighthouse. — Mouth of Alabama River. — Gnathodon inhabiting Brackish Water. — Banks of these Fossil Shells far Inland. — Miring of Cattle. — Yellow Fever at Mobile in 1839. — *Fire in same Year. — Voyage from Mobile to New Orleans. — Movers to Texas. — Lake Pontchartrain. — Arrival at New Orleans. — St. Louis Hotel. — French Aspect of City. — Carnival. — Procession of Masks.*

Feb. 21. 1846. — THERE had been some very cold weather in the beginning of the month in the upper country, the thermometer at Tuscaloosa having been down as low as 17° Fahr.; yet on our return to Mobile, we saw the signs of approaching spring, for on the banks of the Alabama river the deciduous cypress and cotton trees were putting out their leaves, and the beautiful scarlet seed-vessels of the red maple* (*Acer Drummondii*) enlivened the woods.

Once more at Mobile, I was impatient to see, for the first time, the shores of the Gulf of Mexico, and therefore lost no time in making an excursion to the mouth of the Alabama river. I was fortunate in having as my companion the Rev. Dr. Hamilton, minister of the principal Presbyterian congregation, who was well acquainted with the natural history of this region. He drove me first to the lighthouse, where, from the top of the tower, we had a splendid view of the city to the north, and to the south the noble Bay of Mobile, fourteen miles across. The keeper of the lighthouse looked sickly, which is not surprising, as he is living in a swamp in this region of malaria. It was his first year of residence, and the second year is said to be most trying to the constitution. The women, however, of his family, seemed healthy. We then went to the sea-side, two miles to the eastward, and found the waters of the bay smooth and unrippled, like an extensive lake, the woods coming down everywhere to its edge, and the live oaks and long-leaved pines, with the buck-eye and several other trees just beginning to put forth their young leaves. As the most northern countries I had visited in Europe — Norway and Sweden — were characterised by fir trees mingled with birch, I was surprised to find the most southern spot I had yet seen, a plain only a few feet above the level of the sea, almost equally characterised by a predominance of pines. On the ground I observed a species of cactus, about one foot high, and the marshy spots were covered with the candleberry (*Myrica carolinensis*), resembling the species so common in the North, in the scent of its aromatic leaves, but thrice as high as I had seen it before. The most common plant in flower was the English chickweed (*Cerastium vulgare*), a truly cosmopolite species.

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* This plant is very distinct from the red maple (*Acer rubrum*) of the Northern States.

A prodigious quantity of drift timber, of all sizes, and in every stage of decomposition, lay stranded far and wide along the shore. Many of the trunks had been floated a thousand miles and more down the

Mississippi and its tributaries, and, after escaping by one of the many mouths of the great river, had drifted one hundred and fifty miles eastward to this spot. The fact of their long immersion in salt water was sometimes proved by a dense coat of encrusting barnacles, the only marine shells we could find here, for the mollusks proper to this part of the bay are such as belong to fresh or brackish water of the genera *Cyrena, Gnathodon,* and *Neritina.* Just before our visit, a north wind had been blowing and driving back the sea water for some days, and the bay was so freshened by the Alabama river pouring in at this season a full stream, that I could detect no brackish taste in the water. It is, in fact, so sweet here, that ships often resort to the spot to take in water. Yet there is a regular tide rising three feet every six hours, and, when the wind blows from the south, the waters are raised six or seven feet.

After walking over a large expanse of ripple-marked sands, we came to banks of mud, inhabited by the bivalve shell called *Gnathodon,* some of which we dug up alive from a depth of about two inches from the surface. This part of the Bay of Mobile is now the most northern locality of this remarkable brackish-water genus, but dead shells of the same species are traced many miles inland, forming banks three or four feet thick. They are called clams here in popular language, and, being thick and strong, afford a good material for road-making. From the same mud bank we dug out a species of *Cyrena,* the only accompanying shell. In some places not far off, a *Neritina* is also met with. As a geologist, I was much interested by observing the manner in which these shells were living in the mud of the delta of the Alabama river. The deposits formed by the advance of this and other deltas along the northern shores of the Gulf of Mexico, will be hereafter characterised by such shells in a fossil state, just as, in the Pampas, Mr. Darwin and M. A. D'Orbigny found the brackish-water shell, called *Azara labiata*, marking far inland the position of ancient estuaries. And as, in South America, "the Pampean mud," described by Mr. Darwin*, is filled with the skeletons of the extinct *Megatherium*, *Toxodon*, and other strange mammalia, so in the modern delta of the Alabama, the quadrupeds now inhabiting the southern shores of the United States will hereafter be met with buried in the same assemblage of deposits of mud and sand as the *Gnathodon*. I was told that in a great morass which we saw near the lighthouse some cattle had lately perished, and for many days the turkey buzzards have been snatching parts of the dead carcases out of the mud, watching their opportunity the moment the dogs, which are also preying on them, retire. Formerly the wolves used to prowl about these swamps in search of similar booty, tearing up portions of the mired cattle, and in this manner we may expect that, while some skeletons, which have sunk deep into the softer mud, may be preserved entire, the bones of others will be scattered about where the wolves have gnawed them, or birds of prey have picked off the flesh.

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* Geolog. Obs. on S. America (1846), p. 99.

On our way back to the town, at places a mile and a half from the sea, I examined some large banks of fossil shells of the *Gnathodon,* lying as if they had been washed up by the waves at a time when the coast-line extended only thus far south. I also found that the city of Mobile itself was built upon a similar bed of shells, in which no specimens of the *Neritina* occurred; but I was told by Mr. Hale, that he has met with them in banks much farther in the interior, and as he truly remarked, they refute the theory which would refer such accumulations to the Indians, who, it is well known, were accustomed to feed on the *Gnathodon.* The distinct stratification seen in some of the heaps of shells and sand at Mobile, also satisfied me that they were thrown up by the action of water. Mr. Hale gave me a map, in which he had laid down the localities of these beds of fossil *Gnathodon,* some of which he has traced as far as twenty miles into the interior, the accumulations increasing in thickness in the most elevated and inland situations, and containing there an intermixture of the *Neritinæ* with the *Cyrena,* which last seems only to occur in the recent banks of mud and sand. Mr. Hale observes, "that the inland heaps of shells often rise so far above the level of the highest tides, that it seems difficult to account for their position simply by the advance of the delta, and without supposing that there has been a slight upheaval of the land."

In the gardens at Mobile, there were jonquils and snowdrops in flower, and, for the first time, we saw that beautiful evergreen, the yellow jessamine (*Gelsemium sempervirens*), in full bloom, trailed along the wall of Dr. Hamilton's house. Its fragrance is delicious, more like that of our bind-weed than any other scent I could remember. It had not been injured by the late frost, although the thermometer at Mobile had been eight degrees below the freezing point.

The citizens are beginning to flatter themselves that the yellow fever has worn itself out at Mobile, because the hot season of 1845 was so healthy both here and at New Orleans. Some medical men, indeed, confessed to me, that as the wind blew for many weeks from the north, passing over the marshes north of the city during the summer, without giving rise to the usual epidemic, all their former theories as to the origin of the pestilence have been refuted. It may still hold true, that to induce the disease, three causes must concur, namely, heat, a moist ground, and a decaying vegetation; but it seems clear that all these may be present in their fullest intensity, and yet prove quite inoccuous. The dangerous months are July, August, and September, and great is the anxiety of those who then remain in the city. It is fearful to witness the struggle between the love of gain, tempting the merchant to continue at his post, and the terror of the plague, which causes him to stand always prepared for sudden flight. In 1839, such was the dismay, that only 3000 out of a population of 16,000 tarried behind in the city. Dr. Hamilton, one of those who staid, told me that he knew not a single family, a member of which was not attacked by the disease. Out of the 3000, 800 died. All the clergy remained faithful to their duties, and many of them perished.

The yellow fever is not the only scourge which has frequently devastated Mobile. I found it slowly recovering, like so many other American cities, from the ravages of a great fire, which, in 1839, laid the greater part of it in ashes. The fire broke out in so many places at once, as to give too much reason to suspect that it was the work of incendiaries seeking plunder.

Feb. 23.—The distance from Mobile to New Orleans is 175 miles by what is called the inland passage, or the channel between the islands and the main land. We paid five dollars, or one guinea each, for berths in the "James L. Day" steamer, which made about nine miles an hour. Being on the low-pressure principle, she was so free from noise and vibration, that we could scarcely believe we were not in a sailing vessel. The stunning sounds and tremulous motions of the boats on the Southern rivers are at first so distracting, that I often wondered we could sleep soundly in them. The "James L. Day" is 185 feet long, drawing now 5½ feet water, and only seven feet when fully freighted. We sailed out of the beautiful Bay of Mobile in the evening, in the coldest month of the year, yet the air was warm, and there was a haze like that of a summer's evening in England. Many gulls followed our ship, enticed by pieces of bread thrown out to them by the passengers, some of whom were displaying their skill in shooting the birds in mere wantonness. The stars were brilliant as the night came on, and we passed between the islands and main land, where the sea was as smooth as a lake.

On board were many "movers," going to Texas with their slaves. One of them confessed to me, that he had been eaten out of Alabama by his negroes. He had no idea where he was going, but after settling his family at Houston, he said he should look out for a square league of good land to be had cheap. Another passenger had, a few weeks before, returned from Texas, much disappointed, and was holding forth in disparagement of the country for its want of wood and water, declaring that none could thrive there unless they came from the prairies of Illinois, and were inured to such privations. "Cotton," he said, "could only be raised on a few narrow strips of alluvial land near the rivers, and as these were not navigable by steamers, the crop, when raised, could not be carried to a market." He also comforted the mover with the assurance, "that there were swarms of buffalo flies to torment his horses, and sand flies to sting him and his family." To this the undismayed emigrant replied, "that when he first settled in Alabama, before the long grass and canes had been eaten down by his cattle, the insect pests were as great as they could be in Texas." He was, I found, one of those resolute pioneers of the wilderness, who, after building a log-house, clearing the forest, and improving some hundred acres of wild ground by years of labour, sells the farm and migrates again to another part of the uncleared forest, repeating this operation three or four times in the course of his life, and, though constantly growing richer, never disposed to take his ease. In pursuing this singular vocation, they who go southwards from Virginia to North and South Carolina, and thence to Georgia and Alabama, follow, as if by instinct, the corresponding zones of country. The inhabitants of the red soil of the granitic region keep to their oak and hiccory, the "crackers" of the tertiary pine-barrens to their light-wood, and they of the newest geological formations in the sea islands to their fish and oysters. On reaching Texas, they are all of them at fault, which will surprise no geologist who has read Ferdinand Roemer's account of the form which the cretaceous strata assume in that country, consisting of a hard, compact, siliceous limestone, which defies the decomposing action of the atmosphere, and forms table-lands of bare rock, so entirely unlike the marls, clays, and sands of the same age in Alabama.

On going down from the cabin to the lower deck, I found a slave-dealer with sixteen negroes to sell, most of them Virginians. I heard him decline an offer of 500 dollars for one of them, a price which he said he could have got for the man before he left his own State.

Next morning at daylight, we found ourselves in Louisiana. We had already entered the large lagoon, called Lake Pontchartrain, by a narrow passage, and, having skirted its southern shore, had reached a point six miles north of New Orleans. Here we disembarked, and entered the cars of a railway built on piles, which conveyed us in less than an hour to the great city, passing over swamps in which the tall cypress, hung with Spanish moss, was flourishing, and below it numerous shrubs just bursting into leaf. In many gardens of the suburbs, the almond and peach trees were in full blossom. In some places the blue-leaved palmetto, and the leaves of a species of iris (*Iris cuprea*), were very abundant. We saw a tavern called the "Elysian Fields Coffee House," and some others with French inscriptions. There were also many houses with porte-cochères, high roofs, and volets, and many lamps suspended from ropes attached to tall posts on each side of the road, as in the French capital. We might indeed have fancied that we were approaching Paris, but for the negroes and mulattos, and the large verandahs reminding us that the windows required protection from the sun's heat.

It was a pleasure to hear the French language spoken, and to have our thoughts recalled to the most civilised parts of Europe by the aspect of a city, forming so great a contrast to the innumerable new towns we had lately beheld. The foreign appearance, moreover, of the inhabitants, made me feel thankful that it was possible to roam freely and without hindrance over so large a continent,—no bureaus for examining and signing of passports, no fortifications, no draw-bridges, no closing of gates at a fixed hour in the evening, no waiting till they are opened in the morning, no custom-houses separating one State from another, no overhauling of baggage by gensdarmes for the octroi, and yet as perfect a feeling of personal security as I ever felt in Germany or France.

The largest of the hotels, the St. Charles, being full, we obtained agreeable apartments at the St. Louis, in a part of the town where we heard French constantly spoken. Our rooms were fitted up in the French style, with muslin curtains and scarlet draperies. There was a finely proportioned drawing-room, furnished à la Louis Quatorze, opening into a large dining-room with sliding doors, where the boarders and the "transient visitors," as they are called in the United States, met at meals. The mistress of the hotel, a widow, presided at dinner, and we talked French with her and some of the attendants; but most of the servants of the house were Irish or German. There was a beautiful ball-room, in which preparations were making for a grand masked ball, to be given the night after our arrival.

It was the last day of the Carnival. From the time we landed in New England to this hour, we seemed to have been in a country where all, whether rich or poor, were labouring from morning till night, without ever indulging in a holiday. I had sometimes thought that the national motto should be "All work and no play." It was quite a novelty and a refreshing sight to see a whole population giving up their minds for a short season to amusement. There was a grand procession parading the streets, almost every one dressed in the most grotesque attire, troops of them on horseback, some in open carriages, with bands of music, and in a variety of costumes,—some as Indians, with feathers in their heads, and one, a jolly fat man, as Mardi Gras himself. All wore masks, and here and there in the crowd, or stationed in a balcony above, we saw persons armed with bags of flour, which they showered down copiously on any one who seemed particularly proud of his attire. The strangeness of the scene was not a little heightened by the blending of negroes, quadroons, and mulattos in the crowd; and we were amused by observing the ludicrous surprise, mixed with contempt, of several unmasked, stiff, grave Anglo-Americans from the North, who were witnessing, for the first time, what seemed to them so much mummery and tom-foolery. One waggoner, coming out of a cross street in his working-day dress, drove his team of horses and vehicle heavily laden with cotton bales right through the procession, causing a long interruption. The crowd seemed determined to allow nothing to disturb their good humour; but although many of the wealthy Protestant citizens take part in the ceremony, this rude intrusion struck me as a kind of foreshadowing of coming events, emblematic of the violent shock which the invasion of the Anglo-Americans is about to give to the old *régime* of Louisiana. A gentleman told me, that being last year at Rome, he had not seen so many masks at the Carnival there; and, in spite of the increase of Protestants, he thought there had been quite as much "flour and fun" this year as usual. The proportion, however, of strict Romanists is not so great as formerly, and to-morrow, they say, when Lent begins, there will be an end of the trade in masks; yet the butchers will sell nearly as much meat as ever. During the Carnival, the greater part of the French population keep open house, especially in the country.

CHAP. XXVII.

Catholic Cathedral, New Orleans.—French Opera.—Creole Ladies.—Quadroons.—Marriage of Whites with Quadroons.—St. Charles Theatre.—English Pronunciation.—Duellist's Grave.—Ladies' Ordinary.—Procession of Fire Companies.—Boasted Salubrity of New Orleans.—Goods selling at Northern Prices.—Mr. Wilde.—Roman Law.—Shifting of Capital to Baton Rouge.—Debates in Houses of Legislature.—Convention and Revision of the Laws.—Policy of Periodical State Conventions.—Judges cashiered.—Limitation of their Term of Office.

New Orleans, February, 1846.—WALKING first over the most ancient part of the city, called the First Municipality, we entered the Place d'Armes, and saw on one side of the square the old Spanish Government House, and opposite to it the Cathedral, or principal Catholic church, both in an antique style of architecture, and therefore strikingly unlike any thing we had seen for many months. Entering the church, which is always open, we found persons on their knees, as in Catholic countries, although it was not Sunday, and an extremely handsome quadroon woman coming out.

In the evening we went to the French Opera, and were much pleased with the performance, the orchestra being the best in America. The audience were very quiet and orderly, which is said not to be always the case in some theatres here. The French creole ladies, many of them descended from Norman ancestors, and of pure unmixed blood, are very handsome. They were attired in Parisian fashion, not over dressed, and they are usually not so thin as the generality of American women; their luxuriant hair tastefully arranged, fastened with ornamental pins, and adorned simply with a coloured riband or a single flower. My wife learnt from one of them afterwards, that they usually pay, by the month, a quadroon female hairdresser, a refinement in which the richest ladies in Boston would not think of indulging. The word creole is used in Louisiana to express a native-born American, whether black or white, descended from old world parents, for they would not call the aboriginal Indians, creoles. It never means persons of mixed breed; and the French or Spanish creoles here would shrink as much as a New Englander from intermarriage with one *tainted*, in the slightest degree, with African blood. The frequent alliances of the creoles, or Louisianians, of French extraction with lawyers and merchants from the Northern States, help to cement the ties which are every day binding more firmly together the distant parts of the Union. Both races may be improved by such connection, for the manners of the creole ladies are, for the most part, more refined; and many a Louisianian might justly have felt indignant if he could have overheard a conceited young bachelor from the North telling me "how much they were preferred by the fair sex to the hard-drinking, gambling, horse-racing, cock-fighting, and tobacco-chewing Southerners." If the creoles have less depth of character, and are less striving and ambitious than the New Englanders, it must be no slight source of happiness to the former to be so content with present advantages. They seem to feel, far more than the Anglo-Saxons, that if riches be worth the winning, they are also worth enjoying.

The quadroons, or the offspring of the whites and mulattos, sat in an upper tier of boxes appropriated to them. When they are rich, they hold a peculiar and very equivocal position in society. As children, they have often been sent to Paris for their education, and, being as capable of improvement as any whites, return with refined manners, and not unfrequently with more cultivated minds than the majority of those from whose society they are shut out. By the tyranny of caste they are driven, therefore, to form among themselves a select and exclusive set. Among other stories illustrating their social relation to the whites, we were told that a young man of the dominant race fell in love with a beautiful quadroon girl, who was so light-coloured as to be scarcely distinguishable from one of pure breed. He found that, in order to render the marriage legal, he was required to swear that he himself had negro blood in his veins, and, that he might conscientiously take the oath, he let some of the blood of his betrothed into his veins with a lancet. The romance of this tale was however greatly diminished, although I fear that my inclination to believe in its truth was equally enhanced, when the additional circumstance was related, that the young lady was rich.

Some part of the feeling prevailing in New England, in regard to the immorality of New Orleans, may be set down to the fact of their theatres being open every Sunday evening, which is no indication whatever of a disregard of religion on the part of the Catholics. The latter might, with as much reason, reflect on the Protestants for not keeping the doors of their churches open on week-days. But as a great number of the young mercantile men who sojourn here are from the North, and separated from their families, they are naturally tempted to frequent the theatres on Sundays; and if they do so with a sense that they are violating propriety, or acting against what in their consciences they think right, the effect must be unfavourable to their moral character.

During our stay here we passed a delightful evening in the St. Charles theatre, seeing Mr. and Mrs. Kean in the "Gamester" and "The Follies of a Night." Her acting of Mrs. Beverley was perfection; every tone and gesture full of feeling, and always lady-like, never overwrought in the most passionate parts. Charles Kean's acting, especially in Richard, has been eminently successful during his present tour in the United States.

While at New Orleans, Mrs. Kean told my wife she had been complimented on speaking English so well; and some wonder had been expressed that she never omitted or misplaced her h's. In like manner, during our tour in New England, some of the natives, on learning that we habitually resided in London, exclaimed that they had never heard us confound our v's and w's. "The Pickwick Papers" have been so universally read in this country, that it is natural the Americans should imagine Sam Weller's pronunciation to be a type of that usually spoken in the old country, at least in and about the metropolis. In their turn, the English retaliate amply on American travellers in the British Isles:—"You don't mean to say you are an American? Is it possible? I should never have discovered it, you speak English so well!"—"Did you suppose that we had adopted some one of the Indian languages?"—"I really never thought about it; but it is wonderful to hear you talk like us!"

Looking into the shop-windows in New Orleans, we see much which reminds us of Paris, and abundance of articles manufactured in the Northern States, but very few things characteristic of Louisiana. Among the latter I remarked, at a jeweller's, many alligators' teeth polished and as white as ivory, and set in silver for infants to wear round their necks to rub against their gums when cutting their teeth, in the same way as they use a coral in England.

The tombs in the cemeteries on the outskirts of the town are raised from the ground, in order that they may be above the swamps, and the coffins are placed in bins like those of a cellar. The water is seen standing on the soil at a lower level in many places; there are often flowers and shrubs round the tombs, by the side of walks made of shells of the Gnathodon. Over the grave of one recently killed in a duel was a tablet, with the inscription—"Mort, victime de l'honneur!" Should any one propose to set up a similar tribute to the memory of a duellist at Mount Auburn, near Boston, a sensation would be created which would manifest how widely different is the state of public opinion in New England from that in the "First Municipality."

Among the signs of the tacit recognition of an aristocracy in the large cities, is the manner in which persons of the richer and more refined classes associate together in the large hotels. There is one public table frequented by bachelors, commercial travellers, and gentlemen not accompanied by their wives and families, and a more expensive one, called the Ladies' Ordinary, at which ladies, their husbands, and gentlemen whom they invite, have their meal. Some persons who occupy a marked position in society, such as our friend the ex-member of Congress, Mr. Wilde, often obtain leave by favour to frequent this ordinary; but the keepers of the hotels grant or decline the privilege, as they may think proper.

A few days after the Carnival we had another opportunity of seeing a grand procession of the natives, without masks. The corps of all the different companies of firemen turned out in their uniform, drawing their engines dressed up with flowers, ribands, and flags, and I never saw a finer set of young men. We could not help contrasting their healthy looks with the pale, sickly countenances of "the crackers," in the pine-woods of Georgia and Alabama, where we had been spending so many weeks. These men were almost all of them creoles, and thoroughly acclimatised; and I soon found that if I wished to ingratiate myself with natives or permanent settlers in this city, the less surprise I expressed at the robust aspect of these young creoles the better. The late Mr. Sydney Smith advised an English friend who was going to reside some years in Edinburgh to praise the climate:—"When you arrive there it may rain, snow, or blow for many days, and they will assure you they never knew such a season before. If you would be popular, declare you think it the most delightful climate in the world." When I first heard New Orleans commended for its salubrity, I could scarcely believe that my companions were in earnest, till a physician put into my hands a statistical table, recently published in a medical magazine, proving that in the year 1845 the mortality in the metropolis of Louisiana was 1·850, whereas that of Boston was 2·250, or, in other words, while the capital of Massachusetts lost 1 out of 44 inhabitants, New Orleans lost only 1 in 54; "yet the year 1845," said he, "was one of great heat, and when a wider area than usual was flooded by the river, and exposed to evaporation under a hot sun."

It appears that when New Orleans is empty in the summer—in other words, when all the strangers, about 40,000 in number, go into the country, and many of them to the North, fearing the yellow fever, the city still contains between 80,000 and 100,000 inhabitants, who never suffer from the dreaded disease, whether they be of European or African origin. If, therefore, it be fair to measure the salubrity of a district by its adaptation to the constitutions of natives rather than foreigners, the claim set up for superior healthiness may be less preposterous than at first it sounded to my ears. I asked an Irishman if the summer heat was intolerable. "You would have something else to think of in the hot months," said he, "for there is one set of musquitos who sting you all day, and when they go in towards dusk, another kind comes out and bites you all night."

The desertion of the city for five months by so many of the richer residents, causes the hotels, and the prices of almost every article in shops, to be very dear during the remainder of the year. "Goods selling at northern prices" is a common form of advertisement, showing how high is the usual cost of all things in this city. The Irish servants in the hotel assure us that they cannot save, in spite of their high wages, for, whatever money they put by soon goes to pay the doctor's bill, during attacks of chill and fever.

Hearing that a Guide-book of New Orleans had been published, we wished to purchase a copy, although it was of somewhat ancient date for a city of rapid growth. The bookseller said that we must wait till he received some more copies from New York, for it appears that the printing even of books of local interest is done by presses 2000 miles distant. Their law reports are not printed here, and there is only one newspaper in the First Municipality, which I was told as very characteristic of the French race; for, in the Second Municipality, although so much newer, the Anglo-Americans have, during the last ten years, started ten newspapers.

We were very fortunate in finding our old friend, Mr. Richard Henry Wilde, residing in the same hotel, for he had lately established himself in New Orleans, and was practising in the courts of civil law with success. The Roman law, originally introduced into the courts here by the first settlers, was afterwards modified by the French, and assimilated to the Code Napoleon, and finally, by modern innovations, brought more and more into accordance with the common law of England. Texas, in her new constitution, and even some of the older States, those of New England not excepted, have borrowed several improvements from the Roman law. Among these is the securing to married women rights in property, real and personal, so as to protect them from the debts of their husbands, and enable them to dispose of their own property.

Mr. Wilde took me to the Houses of the Legislature, where a discussion was going on as to the propriety of changing the seat of government from New Orleans to some other place in Louisiana, for it had been determined, though by a majority of one only, in a convention appointed for that purpose, that they should go somewhere else, to a place at least sixty miles distant from the metropolis. I remarked, that the accessibility of New Orleans was so great, and so many must be drawn to it by business, that the determination to seek out a new site for a capital, seemed to me incomprehensible. "You will wonder still more," he replied, "when I tell you, that when the convention had been some time at Baton Rouge to frame the new constitution, they thought it advisable to adjourn to New Orleans, where they could consult with lawyers who were attending the courts, and with the principal merchants, and where they might have access to good libraries, and be in daily communication by steam with all parts of the State. In short, they found that for the faithful discharge of their task, they stood in need of a great variety of information which they could obtain nowhere so readily as in the metropolis. Yet it seems never to have struck them that our future law-makers might, with equal profit to the State, derive knowledge from the same sources."

In the House of Representatives, English is spoken exclusively, but in the Senate many were addressing the House in French, and when they sat down an interpreter rose and repeated the whole speech over again in English. An orator was on his legs, maintaining that Baton Rouge had the best claims to become the future capital, a proposition soon afterwards adopted by the majority. Another contended that Donaldsonville ought to be the place, as it would suit the convenience of 26,000 white male citizens, whilst Baton Rouge would only favour the interest of 12,000. This line of argument seemed to me to contain in it an implied censure on the abandonment of New Orleans, but that was no longer an open question. When I afterwards saw the insignificant village of Donaldsonville, I could not help being diverted at the recollection of the inflated terms in which its future prospects had been dwelt upon. The speaker said, "He liked to lift the veil off the face of futurity and contemplate the gigantic strides to wealth, population, and power, which that city was destined to make; he liked to behold it in imagination, as it will be in reality, built up from the bank of the river to the margin of the lake, sustaining and supporting a happy, industrious, and enterprising population of millions, and being at the same time the great emporium of the trade and commerce of the world."

Although I talked much with Louisianians of different classes in society, as to their reasons for changing the site of the capital, I never could satisfy myself that I had fathomed the truth, and suspect that a spirit of envy and antagonism of country against town lies more at the bottom of the measure than they were willing to confess, aggravated, perhaps, in this case, by the rivalry of two races. No one pretended that they wished to retreat to a village, from fear that the populace, or mob, of New Orleans, might control the free action of the representative body. Some told me, that as their members received pay, they were desirous of taking away from them all temptations to protract the session, which the charms of a luxurious metropolis afforded. They also affirmed that, by living in so dear a place, their representatives acquired extravagant notions in regard to the expenditure of public money, and that they were exposed to the influence of rich merchants and capitalists, who gave them good dinners, and brought them round to their opinions.

I asked if a convention for remodelling the constitution had been called for. My informants were generally disposed to think that the time had arrived when such a re-cast of the old system had become unavoidable. The recurrence, they said, of such conventions every twenty-five or thirty years, might seem to European politicians to imply a wish to perpetuate an experimental state of things; but where the population had quadrupled since the last convention,—where thousands of immigrants had poured in from various States, the majority of them speaking a new language, and introducing a new code of laws, into the Second Municipality,—where circumstances connected with their social, religious, political, and financial affairs had so altered,—in a word, where they were unavoidably in a transition state, the best way of guarding against revolutionary movements was to settle on some fixed periods for revising the constitution, and inquiring whether any organic changes were indispensable.

Among other violent proceedings, I found that the late convention had cashiered all the judges of the Supreme Court, although they had been appointed for life, or "quamdiù se benè gesserint," and with very high salaries. They were to have no retiring pensions, and this I remarked was an iniquity, as some of them had doubtless given up a lucrative practice on the faith of enjoying a seat on the bench for life. Some lawyers agreed that the measure was indefensible, and said they presumed that, in the end, the democratic party would elect all the judges annually, by universal suffrage. I met, however, with optimists who were ready to defend every act of the convention. Several of the judges, they said, were superannuated, and it would have been invidious to single them out, and force them to resign. It was better to dismiss the whole. "As for retiring pensions, we hold, with your Jeremy Bentham, that no man can acquire a vested right in a public injury. Men are apt, when they have retained possession of an office for a great part of their lives, to think they own it." "But what is to become of the judges," said I, "who are thus cast off without pensions?" "Old Judge A——," he replied, "owns a plantation, and will go and farm it. Judge B—— will probably get a professor's chair in the new Law University;" and so he went on, providing for all of them. "In future," he continued, "our judges are to be appointed by the Governor and Senate, with good salaries, for eight years; those first named being for two, four, six, and eight years, so that they may go out in rotation; but members of the Legislature cannot be raised to the bench, as in Great Britain." I objected, that such a system might render a judge who desired to be re-elected subservient to the party in power, or at least open to such an imputation. "No doubt," he rejoined; "as in the case of your judges, who may be promoted to higher posts on the bench. As to the corrupting influence of their dependence on a legislature chosen by a widely-extended suffrage, many of your mayors and aldermen are elected for short terms, and exercise judicial functions in England."

CHAP. XXVIII.

Negroes not Attacked by Yellow Fever.—History of Mr. Wilde's Poem.—The Market, New Orleans.—Motley Character of Population.—Levee and Steamers.—First Sight of Mississippi River.—View from the Cupola of the St. Charles.—Site of New Orleans.—Excursion to Lake Pontchartrain.—Shell Road.—Heaps of Gnathodon.—Excavation for Gas-Works—Buried Upright Trees.—Père Antoine's Date-palm.

Before we left New Orleans Mr. Wilde received a message from his negroes, whom he had left behind at Augusta, in Georgia, entreating him to send for them. They had felt, it seems, somewhat hurt and slighted at not having been sooner permitted to join him. He told us that he was only waiting for a favourable season to transplant them, for he feared that men of colour, when they had been acclimatised for several generations in so cool a country as the upper parts of Alabama and Georgia, might run great risk of the yellow fever, although the medical men here assured him that a slight admixture of negro blood sufficed to make them proof against this scourge.

"No one," he said, "feels safe here, who has not survived an attack of the fever, or escaped unharmed while it has been raging." He mentioned the belief of some theorists, that the complaint was caused by invisible animalcules, a notion agreeing singularly with that of many Romans in regard to the malaria of Italy.

The year following this conversation, our excellent friend was himself carried off by this fatal disease. He is well known to the literary world as the author of a work on the "Love and Madness of Tasso," published in 1842, and perhaps still more generally by some beautiful lines, beginning "My life is like the summer rose," which are usually supposed to have derived their tone of touching melancholy, from his grief at the sudden death of a brother, and soon after of a mother, who never recovered the shock of her son's death. As there had been so much controversy about this short poem, we asked Mr. Wilde to relate to us its true history, which is curious. He had been one of a party at Savannah, when the question was raised whether a certain professor of the University of Georgia understood Greek; on which one of his companions undertook to translate Mr. Wilde's verses, called "The Complaint of the Captive," into Greek prose, so arranged as to appear like verse, and then see if he could pass it off upon the Professor as a fragment of Alcæus. The trick succeeded, although the Professor said that not having the works of Alcæus at hand, he could not feel sure that the poem was really his. It was then sent, without the knowledge of Mr. Wilde and his friends, to a periodical at New York, and published as a fragment from Alcæus, and the member of congress for Georgia was vehemently attacked by his political opponents, for having passed off a translation from the Greek as an original composition of his own.

Soon after this affair, Captain Basil Hall mentioned in his "Schloss Hainfeld" (chap. x.), that the Countess Purgstall had read the lines to him, and would not tell him who was the author, but he had little doubt that she had written them herself. The verses had become so popular that they were set to music, and the name of Tampa, a desolate sea-beach on the coast of Florida, was changed into Tempe, the loveliest of the wooded valleys of Greece, in the concluding stanza:—

"My life is like the prints which feet
 Have left on Tampa's desert strand;
Soon as the rising tide shall beat,
 All trace will vanish from the sand.
Yet, as if grieving to efface
All vestige of the human race,
On that lone shore loud moans the sea,—
But none, alas! shall mourn for me!"

In the Countess's version Zara had been substituted for Tampa.

During our stay in New Orleans, Mr. Wilde introduced us to his friend Mr. Clay, the Whig candidate in the late presidential election, and I was glad of the opportunity of conversing with this distinguished statesman. In the principal episcopal church we were very fortunate in hearing Dr. Hawkes preach, and thought the matter and manner of his discourse deserving of his high reputation for pulpit eloquence.

One morning we rose early to visit the market of the First Municipality, and found the air on the bank of the Mississippi filled with mist as dense as a London fog, but of a pure white instead of yellow colour. Through this atmosphere the innumerable masts of the ships alongside the wharf, were dimly seen. Among other fruits in the market we observed abundance of bananas, and good pine-apples, for 25 cents (or a shilling) each, from the West Indies. There were stalls where hot coffee was selling in white china cups, reminding us of Paris. Among other articles exposed for sale, were brooms made of palmetto leaves, and waggon-loads of the dried Spanish moss, or *Tillandsia*. The quantity of this plant hanging from the trees in the swamps surrounding New Orleans, and everywhere in the delta of the Mississippi, might suffice to stuff all the mattresses in the world. The Indians formerly used it for another purpose — to give porosity or lightness to their building materials. When at Natchez, Dr. Dickeson showed me some bricks dug out of an old Indian mound, in which the tough woody fibre of the *Tillandsia* was still preserved. When passing through the stalls, we were surrounded by a population of negroes, mulattos, and quadroons, some talking French, others a patois of Spanish and French, others a mixture of French and English, or English translated from French, and with the French accent. They seemed very merry, especially those who were jet black. Some of the creoles also, both of French and Spanish extraction, like many natives of the south of Europe, were very dark.

Amidst this motley group, sprung from so many races, we encountered a young man and woman, arm-in-arm, of fair complexion, evidently Anglo-Saxon, and who looked as if they had recently come from the North. The Indians, Spaniards, and French standing round them, seemed as if placed there to remind us of the successive races whose power in Louisiana had passed away, while this fair couple were the representatives of a people whose dominion carries the imagination far into the future. However much the moralist may satirise the spirit of conquest, or the foreigner laugh at some vain-glorious boasting about "our destiny," none can doubt that from this stock is to spring the people who will supersede every other in the northern, if not also in the southern continent of America;—

——— "Immota manebunt
Fata tibi . . . . .
Romanos rerum dominos."

Soon after our arrival we walked to the levee, or raised bank of the Mississippi, and, ascending to the top of the high roof of a large steamer, looked down upon the yellow muddy stream, not much broader than the Thames at London. At first I was disappointed that the "Father of Waters" did not present a more imposing aspect; but when I had studied and contemplated the Mississippi for many weeks, it left on my mind an impression of grandeur and vastness far greater than I had conceived before seeing it. We counted thirty-four large steam-ships lying at the wharf, each with their double chimneys, and some of truly magnificent dimensions. The vessel we had chanced to enter, had her steam up and was bound for St. Louis, and we were informed that she would convey us to that city, a distance of 1100 miles in five days, against the current, for eighteen dollars, or 4*l.*, board included.

We next went, for the sake of obtaining a general view of the city and its environs, to the top of the cupola of the St. Charles Hotel, the most conspicuous building in New Orleans, finished in 1836, the lofty dome of which is of a beautiful form. Within the memory of persons now living, there were to be seen on the site of this massive edifice, ducks and other water birds, swimming about in pools of water, in a morass. The architect began the foundation by placing horizontally on the mud a layer of broad planks 2½ inches think, in spite of which, the heavy building has sunk slightly in some places, but apparently without sustaining material injury.

If a traveller has expected, on first obtaining an extensive view of the environs of this city, to see an unsightly swamp, with scarcely any objects to relieve the monotony of the flat plain save the winding river and a few lakes, he will be agreeably disappointed. He will admire many a villa and garden in the suburbs, and in the uncultivated space beyond the effect of uneven and undulating ground is produced by the magnificent growth of cypress and other swamp timber, which have converted what would otherwise have formed the lowest points in the landscape into the appearance of wooded eminences. From the gallery of the cupola we saw the well-proportioned, massive square tower of St. Patrick's

Church, recently built for the Irish Catholics, the dome of the St. Louis Hotel, and immediately below us that fine bend of the Mississippi, where we had just counted the steamers at the wharf. Here, in a convex curve of the bank, there has been a constant gain of land, so that in the last twenty-five years no less than three streets have been erected, one beyond the other, and all within the line of several large posts of cedar, to which boats were formerly attached. New Orleans was called the Crescent City, because the First Municipality was built along this concave bend of the Mississippi. The river in this part of its course varies in breadth from a mile to three quarters of a mile, and below the city sweeps round a curve for eighteen miles, and then returns again to a point within five or six miles of that from which it had set out. Some engineers are of opinion that as the isthmus thus formed is only occupied by a low marsh, the current will in time cut through it, in which case the First Municipality will be deserted by the main channel. Even should this happen, the prosperity of a city which extends continuously for more than six miles along the river would not be materially affected, for its site has been admirably chosen, although originally determined in some degree by chance. The French began their settlements on Lake Pontchartrain because they found there an easy communication with the Gulf of Mexico. But they fixed the site of their town on that part of the great river which was nearest to the lagoon, so as to command, by this means, the navigation of the interior country.

March 5. 1846.—From New Orleans I made a short excursion with Dr. Carpenter and Dr. M'Cormac to Lake Pontchartrain, six miles to the northward. We went first along the "shell road" by the Bayou St. John's, and then returned by the canal. The shell road, so called from the materials used in its construction, namely, the valves of the *Gnathodon cuneatus*, before mentioned, is of a dazzling white colour, and in the bright sunshine formed a strong contrast with the vegetation of the adjoining swamps. Yet the verdure of the tall cypresses is somewhat dimmed by the sombre colour of the grey Spanish moss hanging everywhere from its boughs like drapery. The rich clusters of scarlet and purplish fruit of the red maple (*Acer Drummondii*) were very conspicuous, and the willows have just unfolded their apple-green leaves. The swamp palmetto (*Chamærops adansonia*) raises its fan-shaped leaves, ten feet high, although without any main trunk, like the sea-island palmetto before described. Several of them are surmounted by spikes bearing seeds. Among the spring flowers we gathered violets (*Viola cucullata*), the elegant *Houstonia serpyllifolia*, which we had first seen at Claiborne, and a white bramble (*Rubus trivialis*), the odour of which resembles that of our primrose. The common white clover, also, is most abundant here, as on the banks of the Mississippi, below New Orleans; yet it is not a native of Louisiana, and some botanists doubt whether any of the European species now growing wild in this State are indigenous.

Lake Pontchartrain is about fifteen feet below high water, and two feet below the lowest water of the Mississippi. It is said to have become sensibly shallower in the last forty years, its depth being now fourteen or fifteen feet only, for it receives annual supplies of mud from the Mississippi, poured into it by one of its mouths, called the Iberville river.

The south-east wind sometimes drives the salt water into the great lagoon, and raises its level from five to ten feet. On a mud-bank near the shore I observed the living *Gnathodon*, accompanied by a modiola (*Dreissena?*), and there was a small bank of dead shells on the southern borders of the lake, which may have been thrown up by the waves in a storm, the valves of most of them being separate. I learnt that the road materials before spoken of were procured from the east end, where there is an enormous mound of dead shells, a mile long, fifteen feet high, and from twenty to sixty yards broad. Dr. Riddell, Director of the Mint at New Orleans, estimates the height of some of these shell-banks north of the lake, at twenty feet above its level; yet he thinks they may have been washed up by the waves during storms. I suspect, however, that some change in the relative level of land and sea has taken place since their accumulation. Dr. M'Cormac informed me that he had observed heaps of these same shells recently cast up along the margin of the bay called the Sabine Lake, where the waters of the delta are brackish.

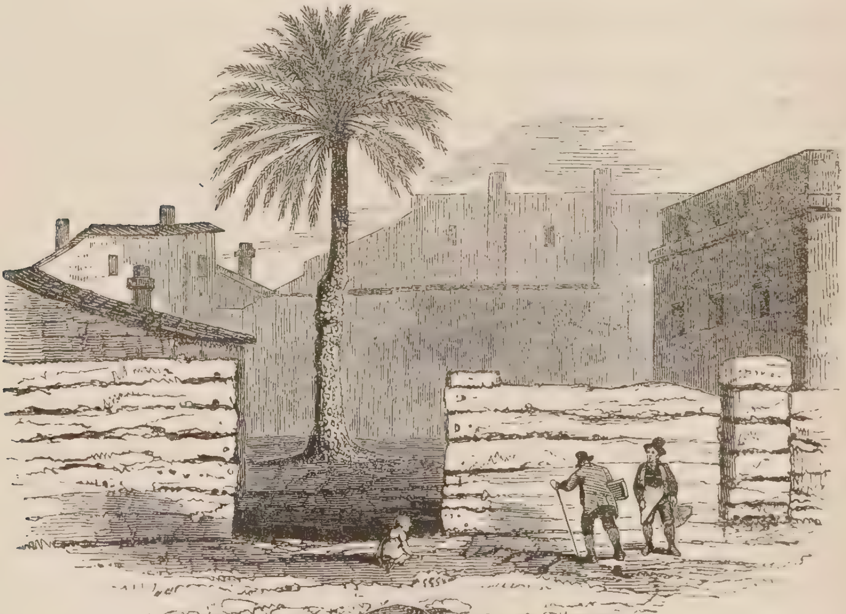
Returning to the bayou, we passed a splendid grove of live oaks on the Metairie ridge, supposed by some to be an old bank of the Mississippi. These bayous, which traverse the delta and alluvial plain of the Mississippi in every direction, are some of them ancient arms of the great river, and others parts of its main channel which have been deserted. They are at a lower level than the present bed of the river, and convey the surface-waters to the sea from that part of the land which the Mississippi is incapable of draining. The bayous are sometimes stagnant and sometimes they flow in one direction when they convey the surplus waters of the Mississippi to the swamps, and in an opposite direction at seasons when they drain the swamps.

When we reached the canal which connects Lake Pontchartrain with New Orleans, we found its surface enlivened with the sails of vessels laden with merchandize. On the stern of one of these I read, in large letters, a favourite name here—"The Democrat." Many features of the country reminded me of Holland. About a mile from the city we passed a building where there is steam machinery for pumping up water and draining the low lands.

It is not easy for a geologist who wishes to study the modern deposits in the delta, to find any natural sections. I was therefore glad to learn that, in digging the foundations of the gas-works, an excavation had been made more than fifteen feet deep, and therefore considerably below the level of the Gulf, for the land at New Orleans is elevated only nine feet above the sea. The contractors had first hired Irishmen, with spades, to dig this pit; but finding that they had to cut through buried timber, instead of soil, they were compelled to engage, instead, 150 well-practised axe-men from Kentucky. I am informed that the superintendant of the gas-works, Dr. Rogers, who is now absent in Cuba, endeavoured to estimate the minimum of time required for the growth of the cypress and other trees, superimposed one upon the other, in an upright position, with their roots as they grew, and had come to the opinion, that eighteen centuries must have been required for the accumulation. At the time of my visit the section was too obscure to enable me to verify or criticise these conclusions; but Mr. Bringier, the State surveyor, told me, that when the great canal, before alluded to, was dug to the depth of nine feet from Lake Pontchartrain, they had cut through a cypress swamp which had evidently filled up gradually, for there were three tiers of the stumps of trees, some of them very old, ranged one above the other; and some of the trunks must have rotted away to the level of the ground in the swamp before the upper ones grew over them. If it be true, as I suspect from these statements, that the stools of trees which grew in fresh water can be traced down to a level below the Gulf of Mexico, we must conclude that the land has sunk down vertically. Perhaps some part of this subsidence might arise from the gradual decay or compression of large masses of wood slowly changing into lignite, for carbonated hydrogen is said to be constantly given out from the soil here wherever such masses of vegetable matter are decomposing; and during the excavation of these works much inflammable gas was observed to escape. That such upright buried trees are not everywhere to be met with in this part of the delta, I ascertained from Mr. Bringier. At his house, in the suburbs of New Orleans, a well has been sunk to the depth of twenty-seven feet, and the strata passed through consisted of sandy clay, with only here and there some buried timber and roots.

Walking through one of the streets of New Orleans, near the river, immediately north of the Catholic cathedral, I was surprised to see a fine date-palm, thirty feet high, growing in the open air. (See fig. 8.)

Fig. 8.



Père Antoine's Date-palm (Phœnix dactylifera).

Mr. Wilde told me, that in 1829, in the island of

Anastatio, opposite St. Augustine, in Florida, he saw one still taller, probably brought there by the Spaniards, who have introduced them into the south of Spain from Africa. The tree is seventy or eighty years old, for Père Antoine, a Roman Catholic priest, who died about twenty years ago, at the age of eighty, told Mr. Bringier that he planted it himself, when he was young. In his will he provided, that they who succeeded to this lot of ground should forfeit it if they cut down the palm. Wishing to know something of Père Antoine's history, I asked a Catholic creole, who had a great veneration for him, when he died. He said it could never be ascertained, because, after he became very emaciated, he walked the streets like a mummy, and gradually dried up, ceasing at last to move; but his flesh never decayed, or emitted any disagreeable odour.

If the people here wish to adorn their metropolis with a striking ornament, such as the northern cities can never emulate, let them plant in one of their public squares an avenue of these date-palms.

CHAP. XXIX.

Excursion from New Orleans to the Mouths of the River. — Steam-Boat Accidents. — River Fogs. — Successive Growths of Willow on River Bank. — Pilot-Station of the Balize. — Lighthouse destroyed by Hurricane. — Reeds, Shells, and Birds on Mud-Banks. — Drift-Wood. — Difficulty of estimating the annual Increase of Delta. — Action of Tides and Currents. — Tendency in the old Soundings to be restored. — Changes of Mouths in a Century inconsiderable. — Return to New Orleans. — Battle-Ground. — Sugar-Mill. — Contrast of French and Anglo-American Races. — Causes of Difference. — State and Progress of Negroes in Louisiana.

Feb. 28. 1846.—BEFORE my arrival at New Orleans, I had resolved to visit the mouths of the Mississippi, and see the banks of sand, mud, and drift timber, recently formed there during the annual inundations. Dr. William Carpenter, although in full practice as a physician, kindly offered to accompany me, and his knowledge of botany and geology, as well as his amiable manners, made him a most useful and agreeable companion.*

I had heard much of the dangers of the Mississippi, and even before I left New England, some of my friends, partly in jest, and partly for the sake of inspiring me with due caution, in the choice of vessels and captains, had told me endless stories of the risks we should run. One of them presented to me a newspaper, containing a formidable array of last year's casualties. Fifty vessels had been snagged, twenty-seven sunk, sixteen had burst their boilers, fifteen had been run into by other vessels, thirteen destroyed by fire, ten wrecked, and seven cut through by ice. This enumeration was followed by an account of the number of persons drowned or injured. Another friend called my attention to a form of advertisement, not uncommon in the St. Louis papers, headed thus, " A fine opportunity of going below." This, he explained, "does not mean *going to the bottom*, as you might naturally conclude (although this is by no means an improbable result of your voyage), but it merely signifies ' going down the river.' " Another offered this piece of advice, " When you are racing with an opposition steam-boat, or chasing her, and the other passengers are cheering the captain, who is sitting on the safety valve to keep it down with his weight, go as far as you can from the engine, and lose no time, especially if you hear the captain exclaim, ' Fire up boys, put on the resin ! ' Should a servant call out, ' Those gentlemen who have not paid their passage will please to go to the ladies' cabin,' obey the summons without a moment's delay, for then an explosion may be apprehended." " Why to the ladies' cabin ? " said I. " Because it is the safe end of the boat, and they are getting anxious for the personal security of those who have not yet paid their dollars, being, of course, indifferent about the rest. Therefore never pay in advance, for should you fall overboard during a race, and the watch cries out to the captain, "A passenger overboard," he will ask, 'Has he paid his passage?' and if he receives an answer in the affirmative, he will call out, 'Go ahead!'"

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* This excellent naturalist, I regret to say, died soon afterwards, in the prime of life, at New Orleans, in 1848.

I shall explain in the sequel why the danger of accidents, in the present state of the navigation, is by no means so great as statistical tables make it appear at a distance; but certainly my first day's experience was not of a character to dispose me to regard the warnings I had received as idle or uncalled for. After we had been seated for half an hour on the deck of the "Wave" steamer, Dr. Carpenter was recommended by a friend to go by preference in a rival boat, just ready to start for the Balize, which he said was safer. We accordingly went into her, and she sailed first. Eight hours afterwards, while we were waiting, as I thought, an unconscionable time, at a landing, while a creole proprietor, who was by no means inclined to be in a hurry, was embarking himself and some black servants, we saw the rival steamer come up very slowly. No sooner had she joined us, than all her passengers poured into our steamer, and told us they had been in the greatest alarm, their steam-pipe having burst; but, most providentially, they had all escaped without serious injury. If I had not already sailed about 1500 miles in Southern steam-boats, since leaving South Carolina, without a mischance, I might have looked on this adventure as very ominous.

The greater part of New Orleans would be annually overflowed by the river, but for the "levee," an artificial embankment, eight or nine feet high, which protects the city. This levee became less and less elevated as we descended the stream. We saw the buildings of several sugar plantations just behind it, at a short distance from the edge of the bank. When we had gone about twenty miles, below the bend called the English turn, I was struck with the resemblance of the Mississippi to the Savannah, Alabama, and Alatamaha rivers, where they flow through a broad alluvial plain, with no bluffs in sight. The swamps on both sides, although several feet lower than the river-banks, have the aspect, as before stated, of wooded eminences.

The distance from New Orleans to the great pilot-station at the mouth of the river, called the Balize, is about 80 miles by land, and 110 by water. We had been told we should reach our destination before night; but we were scarcely half way, when we cast anchor in a dense fog, followed in the course of the night, by much lightning and rain. We found the temperature of the water to be 46° Fahrenheit, while that of the air had varied, in the course of twenty-four hours, from 50° to 75°. This difference between the temperature of the water and air, often amounting to 30° Fahrenheit, gives rise to the fogs which prevail at this season. The river flowing from the north, where there is now much ice and snow, is always much colder, and I am informed by pilots, that as far as the Mississippi water can be traced, by its colour, into the Gulf, it is commonly covered, in the spring, with dense fog, while the atmosphere is clear on each side. These fogs are generated in the same manner as ordinary clouds, by the mixture of two currents of air of different degrees of temperature. The river cools the air in contact with its surface, and this colder layer of air mingling with the warmer layer immediately over it, causes the fog to begin to form close to the water. Hence it is frequently confined to the bed of the river, not spreading at all over the banks. The upper surface is often as well defined as if it were a bed of liquid, instead of vapour, and the cabin, roof, and funnels of a steamer may be seen moving along perfectly unobscured, while the hull and lower parts are as completely hidden as if buried beneath the turbid water on which it floats. The pilot, too, from the upper deck, can often see the shore and landmarks with perfect clearness, and steer his vessel with safety, while the passengers on the cabin deck can see nothing beyond the sides of the boat. The fogs form sometimes whatever be the quarter from which the wind blows, but are more frequent when it is from the south, as the air is then the warmest. Pieces of ice are rarely floated down below Natchez, 350 miles above the Balize; but, in some seasons, they have been known to reach the Gulf itself.

Next morning we weighed anchor, and passed Fort Jackson, formerly Fort St. Philip, thirty-three miles above the Balize. At several points, where we stopped for passengers, Dr. Carpenter and I landed. The wood consisted of live oaks bearing bunches of misletoe, cypress hung with Spanish moss, elms alders, and the red maple; also a species of myrica, twenty feet high, and numerous wild vines, and other climbers, on the trees. At Bayou Liere, there was a dense growth of a fan-palm (*Chamærops adansonia*), from eight to thirteen feet high, and a log-cabin thatched with its leaves, affording good shelter from the heaviest rain. On the ground were numerous land-crabs (*Gelasimus*), called here fiddlers, which ran into their holes as we approached, and a few small lizards, and a frog (*Rana pipiens*), which, in the night, had so shrill and clear a note, that we heard it two miles off. The spring is so backward that few flowers are in bloom, and we congratulated ourselves on escaping all annoyance from musquitos. At the water's edge I picked up several nuts of the *Carya aquatica*, and many pieces of pumice as large as apples, which must have come from the Rocky Mountains, and are interesting, as reminding one of the fact, that volcanic regions are drained by the western tributaries of the Mississippi. But I could not find a single empty land-shell, or helix, such as the Rhine and many other rivers bring down, and am told that none are met with buried in the recent deposits of the delta.

The storm of the preceding night had driven many sea-gulls up the river, which now followed our steamer, darting down to the water to snatch up pieces of apple or meat, or whatever we threw to them. After passing Fort Jackson, all trees disappeared, except a few low willows. We then entered that long promontory, or tongue of land, if such it can be called, which consists simply of the broad river, flowing between narrow banks, protruded for so many miles into the Gulf of Mexico. Each bank, including the swamps behind it, are about 200 or 300 yards wide, covered with dead reeds, among which we saw many tall, white cranes feeding, as in a flooded meadow, and as conspicuous as sheep. The landscape on either side was precisely similar, and most singular, consisting of blue sky, below which were the dark-green waters of the Gulf, lighted up by a brilliant sun; then the narrow band of swamp, covered with dead reeds, and, in the foreground, a row of pale-green willows, scarcely reflected in the yellow turbid water of the river. Occasionally large merchant vessels, some three-masted, were towed up by steam-tugs, through the slack water, near the bank. How the river can thus go to sea as it were, and yet continue for centuries to preserve the same channel, in spite of storms and hurricanes, which have more than once in the last hundred years caused the waters of the Gulf to break over its banks, seems, at first, incomprehensible, till we remember that we have here a powerful body of fresh water flowing in a valley more than a hundred feet deep, with vast mounds of mud and sand on each side, and that the sea immediately adjoining is comparatively shallow.

The growth of willows on that side of the stream where the land is gaining on the water, is often so formal and regular, that they look like an artificial plantation. In the front row are young saplings just rising out of the ground, which is formed of silt, thrown down within the last two or three years. Behind them is an older growth from four to eight feet high. Still farther back is seen a third row twenty-five feet high, and sometimes in this manner five tiers, each overtopping the other, showing the gradual formation of the bank, which inclines upwards, because the soil first deposited has been continually raised during annual floods. While a gain of land is thus taking place on one side, the river is cutting into and undermining the opposite bank, often at the rate of ten feet or more in a year. The most common willow is *Salix nigra,* but Dr. Carpenter tells me there is a rarer species (*Salix longifolia*) intermixed. I inquired how it happened that none of these trees were old, although some part of the banks on which they grew are known to be of considerable antiquity. My companion said, " that in marshy places the *Salix nigra* is not a long-lived tree, rarely lasting more than twenty-five or thirty years.

At length, as we approached the Balize, even these willows ceased to adorn the margin of the river, which was then simply bounded by mounds of bare sand. Balize means beacon in Spanish. It appears, that in 1744 the main passage or entrance of the river was at three small islands, which then existed where this pilot station now stands. It continued to be the principal mouth of the Mississippi for about a quarter of a century later. The present village, called the Balize, has a population of more than 450 souls, among whom there are fifty regularly appointed pilots, and many more who are aspirants to that office. The houses are built on piles driven into the mud-banks, and the greater part of them moored, like ships, to strong anchors, whenever a hurricane is apprehended. They have no fear of the river, which scarcely rises six inches during its greatest floods; but some winds make the Gulf rise six feet, as in the year 1812, and so fast has been the increase of the population of late, that there are scarcely boats enough, as one of the pilots confessed to me, to save the people, should the waters rise again to that elevation. They might, however, escape on drift timber, which abounds here, provided they had time to choose the more buoyant trees; for we observed many large rafts of wood so waterlogged that it could scarcely swim, and the slightest weight would sink it.

Although the chimney of our steamer was not lofty, it stood higher than the houses; but in order to obtain a wider prospect, I went up into the look-out, a wooden frame-work with a platform, where the pilots were watching for vessels, with their telescopes. From this elevation we saw, far to the south, the lighthouse, situated at what is now the principal entrance of the river. The pilots told us, that the old lighthouse, of solid brickwork, eighty-seven feet high, erected on "the south point," was destroyed by a hurricane in the winter of 1839. The keeper was saved, although he was in the building for forty-eight hours before it fell, and during the whole time it vibrated frightfully to and fro. Much of the low banks, then bounding the river, were swept away, but have since been restored.

To the eastward all was sea; turning to the north, or towards New Orleans and the delta, I could discover no more signs of the existence of a continent than when looking southwards, or towards the lighthouse. In the west, Bird Island, covered with trees, was more conspicuous. An old pilot told us it was inhabited by large deer, and was "very high land." "How high above the sea?" said I. "Three or four feet," he replied; and as if so startling an assertion required the confirmation of several witnesses, he appealed to the by-standers, who assented, saying, "It is all that, for it was only just covered during the great hurricane." And well may such an elevation command respect in a town where all the foundations of the houses are under water, and where the value of each site is measured by the number of inches or feet within which a shoal rises to the surface of the sea.

It was a curious sight to behold seventy or more dwellings, erected on piles, among reeds half as high as the houses, and which often grew close to them, most of the buildings communicating with an outhouse by a wooden bridge thrown over a swamp or pool of water, sometimes fresh and sometimes brackish. On one side of the main channel, which our steamer had entered, was built a long wooden platform, made of planks, resting on piles, which served for a promenade, There we saw the pilots' wives and daughters, and among them the belles of the place, well dressed, and accompanied by their pet dogs, taking their evening walk.

March 1. — Having engaged a boat, Dr. Carpenter and I set out on an excursion to examine the bayous or channels between the mud banks. The first stroke of the oars carried us into the midst of a dense crop of tall reeds. This plant (*Arundo phragmitis*), is an annual, and inhabits fresh-water swamps, yet we found many dead barnacles attached to them, showing that in the course of the year, when the river is low, the salt water prevails here, so that these marine cirripeda have time to be developed from the embryo state, and to flourish for some months, till they are killed by the returning fresh water. We could only detect one shell inhabiting these mud banks, a species of *Neritina*. But I am told that the *Gnathodon* is found in the brackish water, a short distance beyond. It was also stated, that about eighteen miles beyond the south-west and north-west passes, or extreme mouths of the river, there are banks of sea-shells of various species. With the arundo was intermixed a tall rush or reed-mace (*Typha*), somewhat resembling the bulrush. We got out and walked on these banks, on which fresh water was standing, so cold and benumbing to the hands, that we had no fear of musquitos. At almost any other season these insects would have swarmed here, and tormented us greatly. Even the alligators were invisible, though some of them had been out a few days before. Many paths, recently trodden by racoons, were seen to traverse the reeds, and there were foot-prints of the civet or mink, and of wild cats and water-rats in abundance. We put up several white herons, and many snipes and curlews, and the boat-tailed grackle (*Quisqualus*).

At length returning to the boat, we soon reached a channel blocked up with drift wood in every stage of decay, some fresh and sound, but most of it rotten and water-logged. We walked for hundreds of yards over natural rafts of this timber, the quantity of which, they say, has sensibly diminished since the steamers began to consume so much fuel, for it is now intercepted in large quantities before it gets to New Orleans, and cut into logs for the steamers.

We were desirous of obtaining accurate information from the pilots respecting the recent advance of land on the Gulf, hoping from such data to calculate the time when the mouths of the river were at New Orleans. But I soon found that materials for such a calculation are not to be procured.

Dr. Carpenter had brought with him Charlevoix's maps of the river mouths or "passes," published 112 years ago, and referring to the state of things about 130 years ago. We were surprised to find how accurately this survey represents, for the most part, the number, shape, and form of the mud-banks and bayous, or channels, as they now exist around the Balize. The pilots, to whom we showed the charts, admitted that one might imagine them to have been constructed last year, were it not that bars had been thrown across the mouths of every bayou, because they are no longer scoured out as they used to be when the principal discharge of the Mississippi was at this point. We then went within a mile of the old Spanish building, called the Magazine, correctly laid down in Charlevoix's map, and now 600 yards nearer the sea than formerly, showing that the mud-banks have given way, or that the salt water has encroached in times when a smaller body of fresh water has been bringing down its sediment to this point.

The south-west pass is now the principal entrance of the Mississippi, and till lately there was eighteen feet water in it, but the channel has grown shallower by two feet. When it is considered that a fleet of the largest men-of-war could sail for a thousand miles into the interior, were it not for the bars thrown across the entrance of each of the mouths or passes, one cannot wonder that efforts should have been made to deepen the main channel artificially. But no human undertaking seems more hopeless; for, after a great expenditure of money in 1838 and 1839, and the excavation by means of powerful steam dredges of a deep passage, the river filled up the entire cavity with mud during a single flood.

One of the chief pilots told us, that since 1839, or in six years, he had seen an advance of the prominent mouths of the river of more than a mile. But Linton, the oldest and most experienced of them, admitted that the three passes called the north-east, south-east, and south-west, had in the last twenty-four years only advanced one mile each. Even this fact would furnish no ground for estimating the general rate at which the delta advances, for on each of these narrow strips of land, or river-banks, the sea would make extensive inroads whenever the main channel of discharge is altered and there is a local relaxation of the river's power. Every year, as soon as the flood season is over, the tide enters far up each channel, scouring out mud and sand, and sweeping away many a bar, formed during the period of inundation. Bringiers, an experienced surveyor of New Orleans, told me, that on revisiting the mouths of the Mississippi after an interval of forty years, he was surprised to observe how stationary their leading features had remained. Mr. Dunbar, also an engineer in great practice in Louisiana, assured me that on comparing the soundings lately made by him with those laid down in the Franch maps of Sieur Diron, published in 1740, he found the changes to be quite inconsiderable. On questioning the pilots on the subject, they stated that the changes from year to year are great, but are no measure whatever of those worked out in a long period, for there seems to be a tendency in the action of the tides and river to restore the old soundings.

Captain Grahame, also a government surveyor, on comparing the north-east pass with the charts made a century before, found it had not advanced more than a quarter of a mile, and that in the same interval the principal variations at the pass à Loutre had consisted in the filling up of some bayous. Even if we could assume that the progress of the whole delta in twenty-five years was as great as that assigned by Linton to one or two narrow channels and banks, it would have taken several thousand years for the river to advance from New Orleans to the Balize; but when we take into our account the whole breadth of the delta, or that part of it which has advanced beyond the general coast-line, above 100 miles across, we must allow an enormous period of time for its accumulation.

The popular belief in New Orleans, that the progress of the banks near the mouths of the river has been very rapid, arises partly from the nature of the evidence given by witnesses in the law courts, in cases of insurance. When a ship is lost, the usual line of defence on the part of the pilots, whether for themselves or their friends, is to show that new sand-bars are forming, and shoals shifting their places so fast, that no blame attaches to any one for running a vessel aground. To exaggerate, rather than underrate the quantity of sediment newly deposited by the river, is the bias of each witness, although their statements may in the main be correct; for in the contest annually carried on between the river and the sea, there is unquestionably a vast amount of destruction and renovation of mud-banks and sand-bars. In these changes the action of the tide, and the power of the breakers during storms, and a strong marine current, all play their part. There seem to be well-authenticated accounts of anchors cast up from a depth of several fathoms near the mouths of the river, and heavy stones sunk sixteen feet deep, and found afterwards high and dry on shoals. The ballast also of several wrecked vessels, the submergence of which, in two or three fathoms water, had been ascertained, have in like manner been thrown up, above high water mark, on newly formed islands.

All the pilots agree, that when the Mississippi is at its height it pours several streams of fresh water, tinged with yellow sediment, twelve or more miles into the Gulf, beyond its mouths. These streams floating over the heavier salt water, spread out into broad superficial sheets or layers, which the keels of vessels plough through, turning up a furrow of clear blue water, forming a dark streak in the middle of the ship's wake. I infer, therefore, that both in the summer, when the swollen river is turbid and depositing mud, and in the winter, when the sea is making reprisals on the delta, there is a large amount of fine sediment dispersed far and wide, and carried by currents to the deeper and more distant parts of the Gulf. To this dispersing power I shall recall the reader's attention in a future chapter, when discussing the probable antiquity of the delta.

March 2.—We returned to New Orleans in the same steamer. It is remarkable that for more than 150 miles above the Balize, there is only one of those great bends in the course of the Mississippi, which are so general a character of its channel north of New Oeleans. The exception is the great sweep called the English Turn. Mr. Forshey imputes this difference in the shape of the bed of the river to the distinct circumstances under which a stream is placed when it shapes out its course through a deposit raised above the level of the sea, or when it is forming its bed, as to the south of New Orleans, below the sea-level.

Above the English Turn, and within a few miles of the metropolis, I landed on the famous battle-ground, where the English, in 1815, were defeated, and saw the swamp through which the weary soldiers were required to drag their boats, on emerging from which, they were fired upon by the enemy, advantageously placed on the higher ground, or river-bank. The blunder of the British commander is sufficiently obvious even to one unskilled in military affairs. They are now strengthening the levee at this point, for the Mississippi is threatening to pour its resistless current through this battle-ground, as, in the delta of the

Ganges, the Hoogly is fast sweeping away the celebrated field of Plassy.

At one of the landings on the left bank of the river, Dr. Carpenter went with me to see a large sugar-mill, in the management of which an Anglo-American proprietor had introduced all the latest improvements. There was machinery, worked by steam, for pressing the juice out of the sugar-canes, and large boilers and coolers, with ducts for the juice to flow down into enormous vats.

We heard much of the injury done to the sugar plantations and gardens by the cocoa, or nut grass (*Cyperus hydra*), which I had seen springing up even in the streets of New Orleans, between the pavement stones. It increases by suckers as well as by seed; but it is only of late years that it has ravaged Louisiana. If horses be brought from an estate where this plant is known to exist, their hoofs are carefully cleaned, lest the soil adhering to them should introduce some fibres or tubers of this scourge.

Although impatient to return to the city, we could not help being amused when we learnt that our boat and all its passengers were to be detained till some hogsheads of sugar were put on board, some of the hoops of which had got loose. A cooper had been sent for, who was to hammer them on. "You may therefore go over the sugar-mill at your leisure." I observed that all whose native tongue was English, were indignant at the small value which the captain seemed to set on their time; but the creole majority, who spoke French, were in excellent humour. A party of them was always playing whist in the cabin, and the rest looking on. When summoned to disembark at their respective landings, they were in no haste to leave us, wishing rather to finish the rubber. The contrast of the two races was truly diverting, just what I had seen in Canada. Whenever we were signalled by a negro, and told to halt "till Master was ready," I was sure to hear some anecdote from an Anglo-Saxon passenger in disparagement of the creoles. "North of New Orleans," said one of my companions, "the American captains are beginning to discipline the French proprietors into more punctual habits. Last summer, a senator of Louisiana having forgotten his great-coat, sent back his black servant to bring it from his villa, expecting a first-rate steamer, with several hundred people on board, to wait ten or fifteen minutes for him. When, to his surprise, the boat started, he took the captain to task in great wrath, threatening never to enter his vessel again."

My attention was next called to the old-fashioned make of the French ploughs. "On this river, as on the St. Lawrence," said an American, "the French had a fair start of us by more than a century. They obtained possession of all the richest lands, yet are now fairly distanced in the race. When they get into debt, and sell a farm on the highest land next the levee, they do not migrate to a new region farther west, but fall back somewhere into the low grounds near the swamp. There they retain all their antiquated usages, seeming to hate innovation. To this day they remain rooted in those parts of Louisiana where the mother country first planted her two colonies two centuries ago, and they have never swarmed off, or founded a single new settlement. They never set up a steam engine for their sugar-mills, have taken no part in the improvement of steam navigation, and when a railway was proposed in Opelousas, they opposed it, because they feared it would 'let the Yankees in upon them.' When a rich proprietor was asked why he did not send his boy to college, he replied, 'Because it would cost me 450 dollars a year, and I shall be able to leave my son three more negroes when I die, by not incurring that expense.'" Dr. Carpenter informed me, that the Legislature of Louisiana granted, in 1834, a charter for a medical college in the Second Municipality, which now, in the year 1846, numbers one hundred students, and is about to become the medical department of a new university. The creoles were so far stimulated by this example, as to apply also for a charter for a French College in the First Municipality. It was granted in the same year, but has remained a dead letter to this day.

One of the passengers had been complaining to me, that a creole always voted for a creole candidate at an election, however much he differed from him in political opinions, rather than support an Anglo-Saxon of his own party. I could not help saying that I should be tempted to do the same, if I were of French origin, and heard my race as much run down as I had done since I left the Balize.

A large portion of the first French settlers in Louisiana came from Canada, and I have no doubt Gayarré is right in affirming that they have remained comparatively stationary, because they carried out with them, from the mother country, despotic maxims of government, coupled with extreme intolerance in their religious opinions. The bigotry which checked the growth of the infant colony was signally displayed, when Louis XIV. refused to permit 400 Huguenot families, who had fled to South Carolina, after the revocation of the edict of Nantes, to be incorporated among the new settlers on the Mississippi.*

Notwithstanding the marked inclination of the Anglo-Saxons to seek no other cause than that of race to account for the alleged stationary condition of the creoles, I was glad to find that one of the most intelligent citizens of New Orleans took a more hopeful and less fatalist view of the matter. "I observe," he said, "that those French emigrants who have come out to us lately, especially the Parisians, are pushing their way in the world with as much energy as any of our race; so I conclude that the first settlers in Canada and Louisiana quitted Europe too soon, before the great revolution of 1792 had turned the Frenchman into a progressive being."

Among the creoles with whom I came in contact, I saw many whose manners were most polite and agreeable, and I felt as I had done towards the Canadian "habitants," that I should have had more pleasure in associating with them than with a large portion of their Anglo-American rivals, who, from a greater readiness to welcome new ideas, are more likely to improve, and will probably outstrip them in knowledge and power.

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* Gayarré, Histoire de la Louisiane, tom. i. p. 69.

When we sat down to dinner in the cabin, one of the creoles, of very genteel appearance, was so dark that I afterwards asked an American, out of curiosity, whether he thought my neighbour at table had a dash of negro blood in his veins. He said he had been thinking so, and it had made him feel very uncomfortable during dinner. I was so unprepared for this manifestation of anti-negro feeling, that I had difficulty in keeping my countenance. The same messmate then told me that the slaves had lately risen on an estate we were just passing, on the right bank of the river, below New Orleans, but had been quickly put down. He said that the treatment of them had greatly improved within the last eight years, keeping pace steadily with the improved civilisation of the whites. The creoles, he said, fed their negroes well, but usually gave them no beds, but blankets only to lie down upon. They were kind in their feelings towards them; but, owing to their improvident habits, they secured no regular medical attendance, and lost more black children than the American planters.

I afterwards remarked that the growth of New Orleans seemed to show that a large city may increase and flourish in a Slave State; but Dr. Carpenter and Mr. Wilde both observed, that the white race has been superseding the negroes. Ten years ago, say they, all the draymen of New Orleans, a numerous class, and the cabmen, were coloured. Now they are nearly all white. The servants at the great hotels were formerly of the African, now they are of the European race. Nowhere is the jealousy felt by the Irish towards the negroes more apparent. According to some estimates, in a permanently resident population not much exceeding 80,000, there are only 22,000 coloured persons, and a large proportion of these are free.

Over a door in the principal street of New Orleans we read the inscription, "Negroes on sale here." It is natural that Southerners should not be aware how much a foreigner is shocked at this public mode of treating a large part of the population as mere chattels.

The following is an advertisement copied verbatim from a Natchez paper:—

"NINETY NEGROES FOR SALE.

"I have about ninety Negroes, just arrived from Richmond, Virginia, consisting of field hands, house servants, carriage drivers, two sempstresses, several very fine cooks (females), and one very fine neat cook (male), one blacksmith, one carpenter, and some excellent Mules and excellent Waggons and Harness, and one very fine Riding Horse—all of which I will sell at the most reasonable prices. I have made arrangements in Richmond, Va., to have regular shipments every month, and intend to keep a good stock on hand of every description of servants during the season.

"Natchez, October 16-tf JOHN D. JAMES."

In a St. Louis paper, I read, in the narrative of a steam boat collision, the following passage: — "We learn that the passengers, with few exceptions, lost all their effects; — one gentleman in particular lost nine negroes (who were on deck) and fourteen horses."

Among the laws recently enacted in Louisiana, I was glad to see one to prevent persons of colour exiled from other States, or transported for some offence, from becoming citizens. In spite of such statutes the negro-exporting portions of the Union will always make the newer States play in some degree the part of penal settlements.

Free blacks are allowed to be witnesses in the courts here, in cases where white men are concerned, a privilege they do not enjoy in some free States, as in Indiana; but they do not allow free blacks to come and settle here, and say they have been compelled to adopt this precaution by the Abolitionists.

An intelligent Louisianian said to me, "Were we to emancipate our negroes as suddenly as your Government did the West Indians, they would be a doomed race; but there can be no doubt that white labour is more profitable even in this climate." "Then, why do you not encourage it?" I asked. "It must be the work of time," he replied; "the prejudices of owners have to be overcome, and the sugar and cotton crop is easily lost, if not taken in at once when ripe; the canes being damaged by a slight frost, and the cotton requiring to be picked dry as soon as mature, and being ruined by rain. Very lately a planter, five miles below New Orleans, having resolved to dispense with slave labour, hired one hundred Irish and German emigrants at very high wages. In the middle of the harvest they all struck for double pay. No others were to be had, and it was impossible to purchase slaves in a few days. In that short time he lost produce to the value of ten thousand dollars."

A rich merchant of Pennsylvania, who was boarding at the St. Louis Hotel, showed me a letter he had just received from Philadelphia, in which his correspondent expressed a hope that his feelings had not often been shocked by the sufferings of the slaves. "Doubtless," said the writer, "you must often witness great horrors." The Philadelphian then told me, that after residing here several years, and having a strong feeling of the evils as well as impolicy of slavery, he had never been forced to see nor hear of any castigation of a slave in any establishment with which he had intercourse. "Once," he added, "in New Jersey (a free State) he remembered having seen a free negro child whipped by its master." The tale of suffering to which his Pennsylvanian correspondent particularly alluded, was not authentic, or, at least, grossly exaggerated. It had been copied from the Abolitionist papers of the North into the Southern papers, somtimes with and sometimes without comment; for such libels are hailed with pleasure by the Perpetualists as irritating the feeling of that class of slave-owners who are most anxious to advance the welfare and education of the negroes.

We ascertained that Miss Martineau's story of Madame Lalaurie's cruelty to her slaves was perfectly correct. Instances of such savage conduct are rare, as was indeed sufficiently proved by the indignation which it excited in the whole city. A New England lady settled here told me, she had promised to set free her two female coloured servants at her death. I asked if she had no fear of their poisoning her. "On the contrary," she replied, "they would be in despair were I to die."

One of the families which we visited at New Orleans was plunged in grief by the death of a little negro girl, suddenly carried off by a brain fever, in the house. She was the daughter of a domestic servant, and the sorrow for her loss was such as might have been felt for a relation.

CHAP. XXX.

Voyage from New Orleans to Port Hudson.—The Coast, Villas and Gardens.—Cotton Steamers.—Flat Boats.—Crevasses and Inundations.—Decrease of Steam-Boat Accidents.—Snag-Boat.—Musquitos.—Natural Rafts.—Bartram on buried Trees at Port Hudson.—Dr. Carpenter's Observations.—Landslip described.—Ancient Subsidence in the Delta followed by an upward Movement, deducible from the buried Forest at Port Hudson.

March 10. 1846.—On leaving New Orleans, I made arrangements for stopping to examine the bluff at Port Hudson, 160 miles up the river, where I was to land in the night, from the Rainbow steamer, while my wife started in another boat, the Magnolia, to go direct to the more distant port of Natchez. If a lady is recommended to the captain of one of these vessels she feels herself under good protection, and needs no other escort; but Mr. Wilde introduced my wife to Judge ——, who kindly undertook to take charge of her, and see her to the hotel at Natchez. The Rainbow ascended the river at the rate of eleven miles an hour, keeping near the bank, where the force of the current was broken by eddies, or where the backwater was sometimes running in our favour. Occasionally her speed was suddenly checked, when it became necessary to cross the stream on reaching a point where the current was setting with its full force against the bank along which we had been sailing. In spite of such delays, the rate of going up is only one-third less than going down the stream. The recent introduction of separate engines to work each of the wheels greatly economises the time spent in the landing of passengers. The boat may be turned round or kept stationary with more facility, when each wheel can be moved in an opposite direction. In this part of the Mississippi, and at this season, the points where passengers can be set ashore are very numerous, the water being often forty feet deep close to the banks. But there are certain regular places of disembarkation, the approach to which is announced by ringing a large bell.

A great proportion of the trees are still leafless, the willows, cypresses, and red maples being no more advanced than I had seen them at Mobile in the third week of February. The gardens continue to be gay with the blossoms of the peach and plum-trees. As our vessel wound its way round one great bend after another, we often saw directly before us the dome of the St. Charles and the tower of St. Patrick's, and were sailing towards them after I thought we had already taken a last look at them far astern. In the first seven hours we made sixty miles, including stoppages. We were passing along what is called "the coast," or that part of the Mississippi which is protected by a levee above the metropolis. A great many handsome country-houses, belonging to the proprietors of sugar plantations, give a cultivated aspect to this region, and the scenery is enlivened by a prodigious number of schooners and large steamers sailing down from the Ohio and Red Rivers, heavily laden with cotton. This cotton has already been much compressed when made up into bales; but it undergoes, at New Orleans, still greater pressure, by steam power, to diminish its bulk before embarkation for Liverpool.

The captain calculated, that within the first seven hours after we left the wharf, in the Second Municipality, we had passed no less than ten thousand bales going down the river, each bale worth thirty-five dollars at present prices, and the value of the whole, therefore, amounting to 350,000 dollars, or 73,500*l.* sterling. All this merchandize would reach the great emporium within twenty hours of the time of our passing it. Before we lost sight of the city, we saw a large flat boat drifting down in the middle of the current, steered by means of a large oar at the stern. It was laden with farm produce, and had come about two thousand miles, from near Pittsburg, on the Ohio. I had first observed this kind of craft on my way to the Balize, meeting near Fort Jackson a boat without a single inmate, thirty-five feet long, and built of stout planks, with a good roof. It was drifting along on its way to the Gulf of Mexico, the owner having abandoned it after selling his corn and other stores at the great city. He himself had probably returned to the North in a steamer; having found the substantial floating mansion, in which he had lived for several weeks or months, quite unsaleable, although containing so much good timber shaped into planks. It is the duty of the wharfinger at New Orleans to see that the river is not blocked up with such incumbrances, and to set them adrift. After wandering for several hundred miles in the Gulf, they are sometimes cast ashore at Pensacola.

Soon afterwards, when we were taking in wood at a landing, I entered another of these flat boats, just arrived there, and discovered that it was a shop, containing all kinds of grocery and other provisions, tea, sugar, lard, cheese, flour, beef, and whiskey. It was furnished with a chimney, and I was surprised to see a large family of inmates in two spacious cabins, for no one would suspect these boats to be so roomy below water, as they are usually sunk deep in the river by a heavy freight. They had a fiddle on board, and were preparing to get up a dance for the negroes. A fellow-traveller told me that these pedlars are commonly called chicken-thieves, and, the day after they move off, the planters not unfrequently miss many of their fowls.

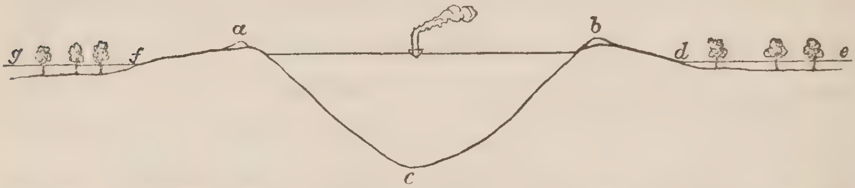
Pointing to an old levee with a higher embankment newly made behind it, the captain told me, that a breach had been made there in 1844, through which the Mississippi burst, inundating the low cultivated lands between the highest part of the bank and the swamp. In this manner, thousands of valuable acres were injured. He had seen the water rush through the opening at the rate of ten miles an hour, sucking in several flat boats, and carrying them over a watery waste into a dense swamp forest. Here the voyagers might remain entangled among the trees unheard of and unheeded till they were starved, if canoes were not sent to traverse the swamps in every direction in the hope of rescuing such wanderers from destruction. When we consider how many hair-breadth escapes these flat boats have experienced, — how often they have been nearly run down in the night, or even in the day, during dense fogs, and sent to the botton by collision with a huge steamer, it is strange to reflect, that at length, when their owners have caught sight of the towers of New Orleans in the distance, they should be hurried into a wilderness, and perish there.

I was shown the entrance of what is called the Cartharge crevasse, formed in May, 1840, and open for eight weeks, during which time, it attained a breadth of eighty feet. Its waters were discharged into Lake Pontchartrain, when nothing was visible between that great lagoon and the Mississippi but the tops of tall cypress trees growing in the morass, and a long, narrow, black stripe of earth, being the top of the levee, which marked the course of the river.

The reader may naturally ask why the Mississippi, when it has once burst through its bank, and taken this shorter cut to the sea, does not continue in the same course, reaching the salt water in a few miles instead of flowing two hundred miles before it empties itself into the Gulf. I may remark in reply, that the great river does not run, as might be inferred from the description of some of the old geographers, on the top of a ridge in a level plain, but in a valley from one hundred to two hundred and fifty feet deep.

Thus *a b c* may represent the cavity in which the river flows, the artificial levees at the top of the banks being seen at *a* and *b*. The banks are higher than the bottom of the swamps, *f g* and *d e*; because, when the river overflows, the coarser part of the sediment is deposited at *a* and *b*, where the speed of the current is first checked. It usually runs there with a gentle current among herbage, reeds, and shrubs; and is nearly filtered of its earthly ingredients before it arrives at the swamps. It is probable that the Mississippi flows to the nearest point of the Gulf, where there is a sufficient depth or capacity in the bed of the sea to receive its vast burden of water and mud; and if it went to Lake Pontchartrain, it would have to excavate a new valley like *a b c*, many times deeper than the bottom of that lagoon.

Fig. 9.



Section of channel, bank, levees (*a* and *b*), and swamps of Mississippi River.

The levee raised to protect the low grounds from inundation, was at first, when we left New Orleans, only four feet high, so as not to impede our view of the country from the deck; but as we ascended, both the natural bank and the levee became higher and higher, and by the time we had sailed up sixty-five miles, I could only just see the tops of tall trees in the swamps. Even these were only discernible from the roof of the cabin, or what is called the hurricane deck, when we had gone 100 miles from New Orleans.

The large waves raised by the rapid movement of several hundred steamers, causes the undermining and waste of the banks to proceed at a more rapid rate than formerly. The roots also of trees growing at the edge of the stream, were very effective formerly in holding the soil together, before so much timber had been cleared away. Now the banks offer less resistance to the wasting action of the stream.

The quantity of drift wood floated down the current has not diminished sensibly within the last twenty years, but nearly all of it is now intercepted in the last forty miles above New Orleans, and split up into logs by the proprietors to supply the furnaces of steam-boats, which are thus freeing the river of the heavy masses against which they used formerly to bump in the night, or round which they were forced to steer in the day. There has also been a marked decrease, of late years, in the number of snags. The trunks of uprooted trees, so called, get fixed in the mud, having sunk with their heavier end to the bottom, and remain slanting down the stream, so as to pierce through the bows of vessels sailing up. A government report just published, shows that two snag-boats, each having a crew of twenty men, one of them drawing four feet, and the other two feet water, have extracted 700 snags in four weeks out of the Missouri, and others have been at work on the Mississippi. When it is remembered that some of the most dangerous of these snags have been known to continue planted for twenty years in the same spot (so slowly does wood decay under water), it may readily be conceived how much this formidable source of danger has lessened in the last few years. At the season when the river is lowest, grappling irons are firmly fixed to these snags, and the whole force of the engines in the snag-boat is exerted to draw them out of the mud; they are then cut into several pieces, and left to float down the stream, but part of them being water-logged, sink at once to the bottom.

Several travellers assure me, that serious accidents are not more common now on the Mississippi and its tributaries, when there are 800 steamers afloat, than twenty years ago, when the number of steamers was less than fifty. The increased security arises, chiefly, from the greater skill and sobriety of the captains and engineers, who rarely run races as formerly, and who usually cast anchor during fogs and in dark nights. Such precautions have, no doubt, become more and more imperative, in proportion as the steamers have multiplied. On the wide Atlantic, the chances of collision in a fog may be slight, but to sail in so narrow a channel as that of a river, at the rate of ten miles an hour, unable to see a ship's length a-head, with the risk of meeting, every moment, other steamers coming down at the rate of fifteen miles an hour, implies such recklessness, that one cannot wonder that navigators on the western waters have earned the character of setting small value on their own and other's lives. Formerly, the most frequent cause of explosions was a deficiency of water in the boiler; one of the great improvements adopted, within the last five years, for preventing this mischief, is the addition of a separate steam apparatus for pumping up water and securing a regular supply by machinery, instead of trusting to the constant watchfulness of the engineers. On the whole, it seems to be more dangerous to travel by land, in a new country, than by river steamers, and some who have survived repeated journeyings in stage-coaches, show us many scars. The judge who escorted my wife to Natchez, informed her that he had been upset no less than thirteen times.

On the left bank, about sixty miles above New Orleans, stands Jefferson College; a schoolmaster from the North, speaking to me of its history, imputed its want of success to the insubordination of the youths, the inability of Southern planters to govern their children themselves, and their unwillingness to delegate the necessary authority to the masters of universities or schools. "But they are growing wiser," he said, "and vigorous efforts are making to improve the discipline in the university of Charlottesville, in Virginia, which has hitherto been too lax."

We soon afterwards passed a convent on the same bank, and I heard praise bestowed on the "Sisters of Charity," for their management of a hospital.

At St. Thomas's Point, about seventy-five miles above New Orleans, we passed a fine plantation, belonging to a brother of Mr. Preston, of South Carolina, a distinguished member of Congress, whose acquaintance I made in 1842. There are, I am told, nearly 1000 negroes here, and I am astonished at the large proportion of the coloured race settled everywhere on the land bordering the river. The relative value of coloured and white labour was here, as elsewhere, a favourite theme of conversation, when there happened to be passengers on board from the Northern States. The task of three negroes, they say, in Louisiana, is to cut and bind up two cords of wood in a day, whereas, a single white man in the State of New York, prepares three cords daily. In packing cotton, the negroes are expected to perform a third less work than a white labourer.

In the afternoon we were overtaken by a heavy thunder shower, the water pouring off the eaves of our cabin roof, in copious streams, into the river, through numerous spouts or tin pipes. When the rain abated, I saw a fog slowly stealing over parts of the stream, for the water was much colder than the air. For some hours we were unable to proceed, and the captain informed me, that we should remain prisoners until the temperature of the Mississippi and that of the atmosphere were more nearly equalised. This, he hoped, would happen in one of two ways, either by a renewal of rain, which would warm the river, or by the wind veering round from south to west, which would cool the air. The latter change soon occurred, and we were instantly released.

I was congratulated by some Northerners at having escaped the musquitos. The captain said, "that they who are acclimatised, suffer no longer from the bites, or scarcely at all, and even the young children of creoles are proof against them, although the face and neck of a new settler, whether young or old, swell up frightfully. Yet the wild cattle and deer have not acquired any hereditary immunity from this torment, and, to escape it, are seen standing in the lakes with their heads only above water." Some passengers assured me, "that when people have recovered from the yellow fever, the skin, although in other respects as sensitive as ever, is no longer affected by a musquito bite, or if at all, in a very slight degree;" and they added, "that last year, 1845, both the yellow fever and the musquitos were in abeyance, although the heat of the season was intense."

After we had sailed up the river eighty miles, I was amused by the sight of the insignificant village of Donaldsonville, the future glories of which I had heard so eloquently depicted.* Its position, however, is doubtless important; for here the right bank is intersected by that arm of the Mississippi, called Bayou La Fourche. This arm has much the appearance of a canal, and by it, I am told, our steamer, although it draws no less than ten feet water, might sail into the Gulf of Mexico, or traverse a large part of that wonderful inland navigation in the delta which contributes so largely to the wealth of Louisiana. A curious description was given me, by one of my fellow travellers, of that same low country, especially the region called Attakapas. It contains, he said, wide "quaking prairies," where cattle are pastured, and where you may fancy yourself far inland. Yet, if you pierce anywhere through the turf to the depth of two feet, you find sea-fish swimming about, which make their way in search of food under the superficial sward, from the Gulf of Mexico, through subterranean watery channels.

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* Ante, p. 123.

Notwithstanding the quantity of sediment in the Mississippi, they tell me that its waters are inhabited by abundance of shad and herring, and in several places, when I asked the fishermen what they were catching, they answered, " Sardines."

In the course of the first day we saw the Bayou Plaquemine on the right, and the Iberville river on the left bank of the Mississippi, the two arms next above that of La Fourche. The Iberville arm, however, has been closed since 1814. One of those natural rafts of floating trees which occasionally bridge over the Western rivers for many years in succession, becoming covered over with soil, shrubs, and trees, blocked up till lately the Bayou Plaquemine. The obstacle was at length removed at the expense of the State, and the rush of water through the newly cleared channel was so tremendous, that several engineers entertained apprehensions, lest the whole of the Mississippi should take its course by this channel to the sea, deserting New Orleans. Mr. Forshey assured me there was no real ground for such fears, because the Mississippi, as before hinted*, takes at present the shortest cut to that part of the Gulf where it can find a basin deep and capacious enough to receive it.

During the night we passed Baton Rouge, the first point above New Orleans where any land higher and older than the alluvial plain comes up to the bank to constitute what is termed a bluff. The cliff there is only a few feet high. The next bluff is at Port Hudson, 25 miles higher up the river, and 165 miles above New Orleans. I had been urged by Dr. Carpenter to examine the geology of this bluff, which I had also wished to do, because Bartram, in his travels in 1777, discovered there the existence of a fossil forest at the base of the tall cliff, and had commented with his usual sagacity on the magnitude of the geographical changes implied by its structure. The following are his words, which deserve the more attention, because the particular portion of the cliff described by him, has long ago been undermined and swept away by the Mississippi. "Next morning," says Bartram, "we set off again on our return home, and called by the way at the cliffs, which is a perpendicular bank or bluff, rising up out of the river near one hundred feet above the present surface of the water, whose active current sweeps along by it. From eight or nine feet below the loamy vegetative mould at top, to within four or five feet of the water, these cliffs present to view strata of clay, marl, and chalk of all colours, as brown, red, yellow, white, blue, and purple; there are separate strata of these various colours, as well as mixed or party-coloured: the lowest stratum next the water is exactly of the same black mud, or rich soil, as the adjacent low cypress swamps above and below the bluff; and here, in the cliffs, we see vast stumps of cypress and other trees which, at this day, grow in these low, wet swamps, and which range on a level with them. These stumps are sound, stand upright, and seem to be rotted off about two or three feet above the spread of their roots; their trunks, limbs, &c. lie in all directions about them. But when these swampy forests were growing, and by what cause they were cut off and overwhelmed by the various strata of earth, which now rise near one hundred feet above, at the brink of the cliffs, and two or three times that height, but a few hundred yards back, are inquiries perhaps not easily answered. The swelling heights, rising gradually over and beyond this precipice, are now adorned with high forests of stately *Magnolia, Liquidambar, Fagus, Quercus, Laurus, Morus, Juglans, Tilia, Halesia, Æsculus, Callicarpa, Liriodendron,*" &c.*

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* Ante, p. 170.

Dr. Carpenter, in 1838, or sixty-one years after Bartram, made a careful investigation of this same bluff, having ascertained that in the interval the river had been continually wearing it away at such a rate as to expose to view a section several hundred feet to the eastward of that seen by his predecessor. I shall first give a brief abstract of Dr. Carpenter's observations, published in Silliman's Journal.†

"About the level of low water, at the bottom of the bluff, a bed of vegetable matter is exposed, consisting of sticks, leaves, and fruits, arranged in thin horizontal laminæ, with very thin layers of clay interposed. Among the fruits were observed the nuts of the swamp hickory (*Juglans aquatica*) very abundant, the burr-like pericarp of the sweet gum (*Liquidambar styraciflua*), and walnuts, the fruit of

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* Bartram, "Travels in North America," p. 433.

† Vol. xxxvi. p. 118.

Juglans nigra. The logs lying horizontally are those of the cypress (*Cupressus thyoides*), swamp hickory, a species of cotton wood (*Populus*), and other trees peculiar to the low swamps of Louisiana. Besides these there were a great number of erect stumps of the large deciduous cypress (*Taxodium distichum*) sending their roots deep into the clay beneath. This buried forest is covered by a bed of clay, twelve feet thick, and is followed by another superimposed bed of vegetable matter, four feet thick, containing logs and branches, half turned into lignite, and erect stumps, among which there are none of the large cypresses, as in the lower bed. Among the logs, the water-oak (*Quercus aquatica*) was recognizable, and a pine with a great deal of bark, and the strobiles of the *Pinus Tæda.*

"This upper forest points to the former existence, on the spot, of one of those swamps, occurring at higher levels, in which the *Cupressus disticha* (*Taxodium*) does not grow. Above the upper layer of erect stumps are various beds of clay, in all more than fifty feet thick, with two thin layers of vegetable matter intercalated; and above the whole more than twenty feet of sand, the lower part of which included siliceous pebbles derived from some ancient rocks, and containing the marks of encrinites and corals (*Favosites*)," &c.

Dr. Carpenter, when he published this account in 1838, thought he had detected the distinct marks of the axe* on some of the logs accompanying the buried stumps; but he informed me, in 1846, that he was mistaken, and that the apparent notches were caused by the gaping open of the bituminised wood, probably after shrinking and drying, of the truth of which I was myself convinced, after seeing the specimens. That the lowest bed had originally been a real cypress swamp, was proved beyond all doubt by the stumps being surrounded by those peculiar knobs or excrescences called cypress knees, which this tree throws out from its base, when it grows in a submerged soil. These knees sometimes rise up through the water from a depth of six or eight feet, and are supposed to supply the roots with air, as they are never formed when the cypress grows on dry ground.

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* Silliman, ibid. p. 119.

At the time of my visit, the river was unfortunately too high to enable me to see the lowest deposit containing the memorials of this ancient forest, the geological interest of which is much enhanced by its having been seen by Bartram, and again by Carpenter, extending horizontally over a considerable area. I learnt from several residents at Port Hudson, and from Captain Sellick, who commanded the Rainbow, that last season, when the water was low, the stumps of the buried trees were as conspicuous as ever at the base of the cliff, which has been much undermined by the river since the year 1838, when Dr. Carpenter explored it. The fossil forest was 12 feet under water when I landed, but at higher levels I saw the trunks of two trees buried in a vertical position at different levels, each of them about 2½ feet high. I estimated the height of the entire cliff to be about 75 feet, consisting in part of stiff unctuous clay, and partly of loam, but with no chalk, as stated by Bartram. A small streamlet, artificially led to the top of the bluff, had, within the last four years, cut out a ravine no less than sixty feet deep through the upper loamy beds. In the sections thus laid open, I saw precisely such deposits as a river would form in its bed, or in the swamps which it had occasionally flooded. Near the bottom was a layer of leaves, resembling those of the bay, with numerous roots of trees and wood in a fresher state than I ever saw them in any tertiary formation. Taking a canoe, I afterwards proceeded to examine that part of the cliff which extends about a mile down the river's left bank, immediately below Port Hudson, where it is between seventy and eighty feet high. The deposits laid open to view were divisible into three groups, the topmost consisting of brown clay, the middle of whitish siliceous sand, and the lower of green clay. I found some men digging the middle or sandy stratum for making bricks, and they had just come upon a prostrate buried tree, black and carbonized, but not turned into lignite. I counted in it 220 rings of annual growth. Near it I found two other smaller fossil trunks, all lying as if they had been drift wood carried down by a river and buried in sand. One of the men pointed out to me that the structure of the wood showed distinctly that they belonged to three different species, one being oak, another hickory, and the third sassafras. Their texture seemed certainly that of distinct genera of trees, but for the accuracy of my informant's determination I cannot vouch. At this point they told me the bluff has, in the course of the last eight years, lost ground no less than 200 feet by the encroachment of the river.

To prove that the present site of the buried forest before alluded to, must be far from the point where Bartram or even Carpenter saw it, an account was given me by the residents here, of several recent land slips near Port Hudson; one in particular, a few years ago, when by the caving in of the bank, three acres of ground, fifty or sixty feet high, composed of clay and sand, and covered by a forest, sank down bodily into the river, and were then gradually washed away. One of the eye-witnesses related to me that the trees were at first seen to tremble, then large rents began to open in the soil deeper and deeper, after which the movement was such that the boughs of the trees lashed each other, and acorns and beech nuts were showered down like hail. A herd of pigs was so intent in devouring these, that they allowed themselves to be carried down vertically fifty feet, the subsidence occupying about five minutes. The outer edge of the bluff, with some of the swine, fell into the river, but these swam to the sunk part of the bluff, and joined their companions. The owners watched them anxiously till dusk, unable to go to their rescue; but at length, to their surprise, they saw a leader, followed by all the rest, wind his way along narrow ledges on the face of the precipice, from which the fallen mass had been detached, and climb up to the top. Next morning, to their no less astonishment, they found the herd feeding again on the same perilous ground, and saw them again return by the same path at night.

I have dwelt at some length on the geological phenomena disclosed in the interesting sections of these bluffs, because I agree with Bartram and Carpenter, that they display a series of deposits similar to the modern formations of the alluvial plain and delta of the Mississippi. They lead us, therefore, to the important conclusion, that there have been changes in the relative level of land and sea since the establishment, in this part of the continent, of a geographical state of things approximating to that now prevailing. Then, as now, there were swamps in which the deciduous cypress and other trees grew, and became buried in mud, without any intermixture of sand or pebbles. At that remote period, also, drift wood was brought down from the upper country, and enclosed in sandy strata. Although I could not ascertain the exact height above the level of the sea, of the fossil cypress swamp at Port Hudson, I presume it is less than thirty feet; and in order to explain the superposition of 150 feet of freshwater sediment, we must imagine the gradual subsidence of fluviatile strata to a depth far below the level of the sea, followed by an upward movement to as great an amount. The depression must have taken place so slowly as to allow the river to raise the surface by sedimentary deposition continually, and never permit the sea to encroach and cover the area. It is quite conceivable, for example, that the present delta and alluvial plain should sink 150 feet without the salt water coming up even to New Orleans, provided the land went down only a few feet or inches in a century, and provided the ground was raised vertically to the same amount by fluviatile mud, sand, or vegetable matter. But if the land should go down even ten or twelve feet at once, the whole delta would be submerged beneath the sea. Were the downward movement here supposed to be followed by an upheaval to the extent of about 150 feet, and should the river then cut a channel through the upraised mass, we might expect to see the modern formation exhibit appearances similar to those of high antiquity above described at Port Hudson.

I shall endeavour, in the sequel, to show that oscillations of level, like those here assumed to account for the phenomena at Port Hudson, will explain other appearances, observable, not only in cliffs bounding the valley of the Mississippi, but in ancient alluvial terraces bordering the Ohio, and other tributaries of the great river.

CHAP. XXXI.

Fontania near Port Hudson.—Lake Solitude.—Floating Island.—Bony Pike.—Story of the Devil's Swamp.—Embarking by Night in Steam-Boat.—Literary Clerk.—Old Levees undermined.—Succession of upright buried Trees in Bank.—Raccourci cut off.—Bar at Mouth of Red River.—Shelly Freshwater Loam of Natchez.—Recent Ravines in Table-Land.—Bones of extinct Quadrupeds.—Human Fossil Bone.—Question of supposed co-existence of Man with extinct Mammalia discussed.—Tornado at Natchez.—Society, Country-Houses and Gardens.—Landslips.—Indian Antiquities.

AFTER I had examined the bluff below Port Hudson, I went down the river in my boat to Fontania, a few miles to the south, to pay a visit to Mr. Faulkner, a proprietor to whom Dr. Carpenter had given me a letter of introduction. He received me with great politeness, and, at my request, accompanied me at once to see a crescent-shaped sheet of water on his estate, called Lake Solitude, evidently an ancient bed of the Mississippi now deserted. It is one of the few examples of old channels which occur to the east of the great river, the general tendency of which is always to move from west to east. Of this eastward movement there is a striking monument on the other side of the Mississippi immediately opposite Port Hudson, called Fausse Rivière, a sheet of water of the usual horse-shoe form. One of my fellow passengers in the Rainbow had urged me to visit Lake Solitude, "because," said he, "there is a floating island in it, well wooded, on which a friend of mine once landed from a canoe, when, to his surprise, it began to sink with his weight. In great alarm he climbed a cypress tree, which also began immediately to go down with him as fast as he ascended. He mounted higher and higher into its boughs, until at length it ceased to subside, and, looking round, he saw in every direction, for a distance of fifty yards, the whole wood in motion." I wished much to know what foundation there could be for so marvellous a tale. It appears that there is always a bayou or channel, connecting, during floods, each deserted bend or lake with the main river, through which large floating logs may pass. These often forms rafts, and become covered with soil supporting shrubs and trees. At first such green islands are blown from one part of the lake to another by the winds, but the deciduous cypress, if it springs up in such a soil, sends down strong roots, many feet or yards long, so as to cast anchor in the muddy bottom, rendering the island stationary.

Lake Solitude, situated in lat. 31° N. is two miles and a half in circuit, and is most appropriately named, being a retired sheet of water, its borders overhung by the swamp willow, now just coming into leaf, and skirted by the tall cypress, from which long streamers of Spanish moss are hanging. On the east it is bounded by high ground, a prolongation of the bluff at Port Hudson, on which the hickory, the oak, and many splendid magnolias, with the beech, walnut, tulip tree, and holly, and a variety of beautiful shrubs are seen. The surface of the lake (except near the shore, where it is covered with the water lily) faithfully reflects the trees and sky, presenting, in this respect, a marked contrast to the yellow waters of the Mississippi. It is inhabited by hundreds of alligators and countless fish, and so many birds were swimming on it, or flying over it, that it seemed as if all the wild creatures which the steamers had scared away from the main river had taken refuge here. Several alligators were lying motionless, with their noses just above the surface of the water, resembling black logs. About fourteen years ago, some of them were not unfrequently seen here measuring fifteen feet in length, but they now rarely exceed eight feet. I observed a large gar-fish or bony pike, called the alligator gar (*Lepidosteus*), leap nearly out of the water in pursuit of its prey. Its hard shining scales are so strong and difficult to pierce, that it can scarcely be shot. It can live longer out of water than any other fish of this country, having a large cellular swimming bladder, which is said almost to serve the purpose of a real lung. One of them has been known to seize the nostrils of a mule who was drinking, and only to be shaken off on dry ground, when its whole body had been dragged into the air.

On the boughs of the willows were perched several white cranes, while herons, cormorants, and water-rails were swimming on the lake, their various notes adding to the wildness of the scene. Shriller than all, as the evening came on, we heard the voice of the large bull-frog.

As we went back to the house, over the high ground, we saw three kinds of squirrels and many birds. So skilful was my companion with his rifle, that he brought down every bird which came within shot -- owls, rice-birds, woodpeckers, and jays — that I might examine their plumage. I admired a beautiful cluster of the flowers and fruit of the red maple, above twenty feet about our heads. He offered to pick them for me, and, without delay, took aim so dexterously, as to sever the twig from the bough just below the blossom, without seeming to have injured the flower by a single shot. In the course of our walk, I observed several shrubs, almost hidden by the luxuriant growth of that most elegant of climbers, the yellow jessamine (*Gelsemium nitidum*), with its fragrant blossoms.

From these heights south of Port Hudson, we had a grand view of the great plain of the Mississippi, far to the south and west, an endless labyrinth of uninhabited swamps, covered with a variety of timber, and threaded with bayous, one resembling another so exactly, that many a stranger, who has entered them in a canoe, has wandered for days without being able to extricate himself from their woody mazes. Among these morasses, one called the Devil's Swamp was in sight, and I found a curious account of the origin of its name in a MS. dated 1776, of Caleb Carpenter, a relation of my New Orleans friend.

A German emigrant having settled near the bank of the Mississippi, in 1776, felled, with great labour, some lofty cypresses; but, happening one day to make a false turn in his canoe, entered, by mistake, a neighbouring bayou. Every feature was so exactly like the scene where he had been toiling for weeks, that he could not question the identity of the spot. He saw all the same bends, both in the larger and smaller channels. He made out distinctly the same trees, among others the very individual cypresses which he had cut down. There they stood, erect and entire, without retaining one mark of his axe. He concluded that some evil spirit had, in a single night, undone all the labour of many weeks; and, seized with superstitious terror, he fled from the enchanted wood, never to return.

In order that I might not spend an indefinite time on the Mississippi, I determined to be prepared for a start in the first chance steamer which might be bound for Natchez, 140 miles distant, whenever an opportunity should offer, whether by day or night. I was told by my host that a trusty black servant had been already appointed to look out for a steamer, which was to convey some farm produce to a proprietor far off on the Red River. He proposed, therefore, to give orders to this negro to wake me if any boat bound for Natchez should appear in sight before morning. Accordingly, about an hour after midnight, I was roused from my slumbers, and went down over a sloping lawn to the steam-boat landing on the river's bank. The sky was clear, and it was bright moonlight, and the distant cries of the owls, and other night-birds around Lake Solitude, were distinctly heard, mingled with the chirping of myriads of frogs. On the low bank my watchman had lighted a signal fire, and I heard the puffing of a steamer in the distance ascending the stream. She soon neared us, and, on being hailed, answered, "La Belle Creole, bound for Bayou Sara." This port was far short of my destination, and when we shouted "Natchez," the captain first asked if we had any wood to sell, and on learning there was none, sailed away. I returned to the house, and took another nap of several hours, when I received a second summons from my faithful sentinel. The scene was entirely changed; it was nearly day-break, and the fogs rising from the marshes had begun to cover the river. I was in despair, fearing that our signal fire would not be discerned through the mist. Soon, however, we heard the loud gasping of the two steam-pipes sounding nearer and nearer, and a large steamer coming suddenly close to the landing, was announced as "the Talma of Cincinnati." In a few minutes I was crossing the narrow plank which led from the steep bank to the vessel, which was actually in motion as I walked over it, so that I was glad to find myself safe on deck. They told me I must register my name at the office. The clerk asked me if I was the author of a work on geology, and being answered in the affirmative, wished to know if I was acquainted with Mr. Macaulay. On my saying yes, he took out a late number of the Edinburgh Review, and begged me to tell him whether the article on Addison was written by my friend, for he had been discussing this matter with a passenger the evening before. When I had confirmed this opinion he thanked me, expressing much regret that he should not see me again, since I was to land next day at Natchez before he should be up. This conversation lasted but a few minutes, and in as many more I was in a good berth under a musquito net, listening to a huge bell tolling in the fog, to warn every flat-boat to get out of the way, on peril of being sent instantly to the bottom. In spite of this din, and that of the steam funnels and machinery, I soon fell asleep for the third time.

When I came on deck next day, all hands were at work, taking in wood at a landing below Bayou Sara, where I saw on the top of the river bank, now sixteen feet high, several striking memorials of the ravages of former inundations. Besides the newest levee, there was one which had given way previously to the great flood of 1844, and a still older one, which, although once parallel, was now cut off abruptly, and at right angles to the present course of the river. They reminded me of the remnant of an oval entrenchment at the edge of the cliff near Newhaven in Sussex, and of those paths leading directly to the brink of precipices overhanging the sea in many maritime counties in England. Farther on, at another wooding station, in Adams county, Mississippi, I observed a bank eighteen feet in perpendicular height, and said to be forty-five feet high when the water is at its lowest. It was composed of sand, or sandy loam, indicating a comparatively rapid deposition. In such loam, no erect stumps and trunks of trees are met with, the sediment having accumulated on the margin of the river in a few years too fast to allow large trees to grow there. But in other places, where the bank consisted of fine, stiff clay, I saw here and there the buried stools of cypresses, and other trees, in an upright position, with their roots attached, sometimes repeated at several different levels in the face of the same bank. I first remarked one of these at a point forty-five miles above New Orleans, and they increased in number as we ascended. When first told of this phenomenon, before visiting the Mississippi, it appeared to me very difficult of explanation. I soon, however, discovered that the great river, in its windings, often intersects the swamps or cypress basins which had been previously filled up with fine mud or vegetable matter, at various distances from the former river-channel.

Suppose an ancient bed of the Mississippi, or some low part of the plain, to become fit for the growth of cypress, yet to be occasionally flooded, so that the soil is slowly raised by fine mud, drift wood, or vegetable matter like peat. As the cypress (*Taxodium distichum*) often attains to the age of three or four centuries, and, according to many accounts, occasionally in Louisiana to that of two thousand years, it is clear that the bottoms of the oldest trees will often be enveloped in soil several feet deep, before they die, and rot down to the point where they have been covered up with mud. In the mean time other trees will have begun to grow on adjoining spots, at different and considerably higher levels, and eventually some of these will take root in soil deposited directly over the stump or decayed trunk of some of the first or oldest series of cypresses. They who have studied the delta affirm that such successive growths of trees are repeated through a perpendicular height of twenty-five feet without any change occurring in the level of the land.*

Proceeding up the river, we soon passed Bayou Sara on our right hand, and came to the isthmus called the Raccourci cut-off, across which a trench nine feet deep has been dug, in the hope that the Mississippi would sweep out a deep channel. This "cut-off," should it ever become the main channel, would enable a steamer to reach, in one mile, a point, to gain which costs now a circuit of twenty-six miles, and two and a half hours. Unfortunately, when they cleared the forest in this spot, the soil of the new canal was found to consist of a stiff blue clay, strengthened by innumerable roots of trees, and, in the flood of 1845, the surplus waters of the Mississippi poured through the cut with great velocity, yet failed to deepen it materially. By shortening the channel twenty-five miles, the fall of the river would be augmented, and the engineer flattered himself that the effect might extend as far up as the mouth of the Red River. By accelerating the current there it was hoped that a deeper passage might be kept open in the sand-bar, which now blocks up the navigation of that important tributary for the greater part of the year.

Some experienced pilots assured me, that the supposed shortening of the channel of the Mississippi, between its junction with the Ohio and New Orleans, was, in a great degree, a delusion. Instead of the boasted gain of fifty miles, they say that not a third of this distance has been realised. Immediately after the completion of a new cut-off, the Mississippi begins to restore the natural curvature of its channel by eating away one bank and throwing out a sand-bar on the opposite side.

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* See Dickeson and Brown, Silliman's Journal, Second Series, vol. v. p. 17. Jan. 1848.

Another fifty miles brought us to the mouth of the Red River, where I saw the formidable bar, before alluded to, covered, for the most part, by a growth of young willows and cotton-wood (*Populus angulata*). After leaving the mouth of Red River, we passed two bluffs on the left or eastern bank, one that of Fort Adams, a very picturesque line of precipices, the other called Ellis's Cliffs. In both I observed a predominance of white sand, similar to that seen in part of the bluff at Port Hudson.

At Natchez (where I rejoined my wife), there is a fine range of bluffs, several miles long, and more than 200 feet in perpendicular height, the base of which is washed by the river. The lower strata, laid open to view, consist of gravel and sand, destitute of organic remains, except some wood and silicified corals, and other fossils, which have been derived from older rocks; while the upper sixty feet are composed of yellow loam, presenting, as it wastes away, a vertical face towards the river. From the surface of this clayey precipice are seen, projecting in relief, the whitened and perfect shells of land-snails, of the genera *Helix, Helicina, Pupa, Cyclostoma, Achatina,* and *Succinea.* These shells, of which we collected twenty species, are all specifically identical with those now inhabiting the valley of the Mississippi.

The resemblance of this loam to that fluviatile silt of the valley of the Rhine, between Cologne and Basle, which is generally called "loess" and "lehm" in Alsace, is most perfect. In both countries the genera of shells are the same, and as, in the ancient alluvium of the Rhine, the loam sometimes passes into a lacustrine deposit containing shells of the genera *Lymnea*, *Planorbis*, and *Cyclas*, so I found at Washington, about seven miles inland, or eastward from Natchez, a similar passage of the American loam into a deposit evidently formed in a pond or lake. It consisted of marl containing shells of *Lymnea*, *Planorbis*, *Paludina*, *Physa*, and *Cyclas*, specifically agreeing with testacea now inhabiting the United States. With the land-shells before mentioned are found, at different depths in the loam, the remains of the mastodon; and in clay, immediately under the loam, and above the sand and gravel, entire skeletons have been met with of the megalonyx, associated with the bones of the horse, bear, stag, ox, and other quadrupeds, for the most part, if not all, of extinct species. This great loamy formation, with terrestrial and fresh-water shells, extends horizontally for about twelve miles inland, or eastward from the river, forming a platform about 200 feet high above the great plain of the Mississippi. In consequence, however, of the incoherent and destructible nature of the sandy clay, every streamlet flowing over what must originally have been a level table-land, has cut out for itself, in its way to the Mississippi, a deep gully or ravine. This excavating process has, of late years, proceeded with accelerated speed, especially in the course of the last thirty or thirty-five years. Some attribute the increased erosive action to partial clearings of the native forest, a cause of which the power has been remarkably displayed, as before stated, within the last twenty years, in Georgia.* Others refer the change mainly to the effects of the great earthquake of New Madrid, in 1811—12, by which this region was much fissured, ponds being dried up and many landslips caused.

In company with Dr. Dickeson and Colonel Wailes, I visited a narrow valley, hollowed out through the shelly loam recently named "the Mammoth ravine," from the fossils found there. Colonel Wiley, a proprietor of that part of the State of Mississippi, who knew the country well before the year 1812, assured me that this ravine, although now seven miles long, and in some parts sixty feet deep, with its numerous ramifications, has been entirely formed since the earthquake. He himself had ploughed some of the land exactly over one spot which the gully now traverses.

A considerable sensation was recently caused in the public mind, both in America and Europe, by the announcement of the discovery of a fossil human bone so associated with the remains of extinct quadrupeds, in "the Mammoth ravine," as to prove that man must have co-existed with the megalonyx and its contemporaries. Dr. Dickeson showed me the bone in question, admitted by all anatomists to be part of a human pelvis, and being a fragment of the *os innominatum*. He felt persuaded that it had been taken out of the clay underlying the loam, in the ravine above alluded to, about six miles from Natchez. I examined the perpendicular cliffs, which bound a part of this water-course, where the loam, unsolidified as it is, retains its verticality, and found land-shells in great numbers at the depth of about thirty feet from the top. I was informed that the fossil remains of the mammoth (a name commonly applied in the United States to the mastodon) had been obtained, together with the bones of some other extinct mammalia, from below these shells in the undermined cliff. I could not ascertain, however, that the human pelvis had been actually dug out in the presence of a geologist, or any practised observer, and its position unequivocally ascertained. Like most of the other fossils, it was, I believe, picked up in the bed of the stream, which would simply imply that it had been washed out of the cliffs. But the evidence of the antiquity of the bone depends entirely on the part of the precipice from which it was derived. It was stained black, as if buried in a peaty or vegetable soil, and may have been dislodged from some old Indian grave near the top, in which case it may only have been five, ten, or twenty centuries old; whereas, if it was really found in situ at the base of the precipice, its age would more probably exceed 100,000 years, as I shall endeavour to show in a subsequent chapter. Such a position, in fact, if well authenticated, would prove that man had lived in North America before the last great revolution in the physical geography of this continent had been accomplished; in other words, that our race was more ancient than the modern valley, alluvial plain, and delta of the Mississippi,—nay, what is more, was antecedent to the bluffs of Port Hudson and Natchez, already described. Now that elevated freshwater formation, as I shall by and by endeavour to show, is the remnant of a river-plain and delta of extremely high antiquity; and it would follow, if the human race was equally ancient, that it co-existed with one group of terrestrial mammalia, and, having survived its extinction, had seen another group of quadrupeds succeed and replace it.

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* See ante, p. 25.

In our excursion through the forest, from Washington to the Mammoth ravine, I crossed the path of the last tornado, which occurred May 17. 1840, one of three which have devastated this region since the year 1809. They all came from Texas, moving along from south-west to north-east, and laid waste a long strip of country, about a mile wide. The courses of each of the three whirlwinds were within a few miles of the other, and the last threw down many houses at Natchez, unroofed others, and levelled to the ground a railway terminus, causing the abandonment of a scheme for a rapid communication between Natchez, Vicksburg, and the State of Tennessee. On each side of the path of the tornado the land was finely timbered; but where its force had been expended, old trees lay uprooted, and a growth of young wood was rising. Many large trunks had been broken off ten or twelve feet above the ground, and portions of the solid wood, torn and twisted into shreds, were still waving in the air.

This tornado checked the progress of Natchez, as did the removal of the seat of Legislature to Jackson; but it has suffered still more, since steam navigation has been so much improved, by the all-absorbing importance acquired by New Orleans as the great emporium of the whole trade of the Mississippi. There are, however, so few bluffs on the great river, so few places where the channel will remain constant for ages to the same spot, that I cannot doubt that this city must, in time, become large and prosperous.

It augurs favourably of the future prospects of civilisation in America, that here, as elsewhere, we found the society most agreeable in places which have been the longest settled. If the political opinions and notions of honour cherished by the majority of the citizens at Natchez, had had their due weight in the legislation of the State, the fair fame of Mississippi, and her credit, would have stood as high as that of any other Southern State. Many of the country-houses in the neighbourhood are elegant, and some of the gardens belonging to them laid out in the English, others in the French style. In the latter are seen terraces, with statues and cut evergreens, straight walks with borders of flowers, terminated by views into the wild forest, the charms of both being heightened by contrast. Some of the hedges are made of that beautiful Chinese plant, the Gardenia florida, miscalled in England the Cape jessamine, others of the Cherokee rose, with its bright and shining leaves. It had already put forth some of its white flowers, which a month later would be in full blow. The woods here, when all the trees are in full foliage, and the tall magnolias in blossom, must be truly beautiful. But so intense is the heat, and such the danger of ague and the torment of musquitos, that, at that season, they who can afford to move, fly to some higher or more northern retreat.

On the steep slope of the bluffs at Natchez, below the vertical face of shelly loam, the Judas-tree, or red bud (*Cercis canadensis*), was now in full flower, displaying a blaze of pink blossoms before it has put forth any leaves. I saw four landslips on these bluffs which have occurred within the last ten years, for the springs which burst from the sand undermine the clayey loam. They are instructive, as showing how the bluffs give way as the Mississippi gradually extends its course eastwards. There is one hollow of ancient date, caused by a similar undermining, called the Devil's Punch-bowl, a picturesque, crater-shaped basin, of about 300 yards diameter at the top, and 100 yards at the bottom, where cypresses and gum-trees are growing. At the top are seen the cotton-wood, the maple, and the magnolia, mixed with pines.

The name of Natchez has been derived from an Indian tribe, and on the highest part of the bluff, on an eminence called St. Rosalie, are some Indian mounds, from which Dr. Dickeson has obtained some curious remains of pottery, showing that some of the aboriginal inhabitants of the great valley had made much greater progress in the arts than their descendants whom the Europeans drove out. One morning, close to the spot where these antiquities were dug up, we saw a wild-looking group of Indians, whose aspect gave no token that their contact with Europeans had tended to revive the spirit of improvement which must once have animated some of their predecessors in this region.

CHAP. XXXII.

Natchez. — Vidalia and Lake Concordia. — Hybernation of Alligator. — Bonfire on floating Raft. — Grand Gulf. — Magnolia Steamer. — Vicksburg to Jackson (Mississippi) by Railway. — Fossils on Pearl River. — Ordinary at Jackson. — Story of Transfer of State-House from Natchez. — Vote by Ballot. — Popular Election of Judges. — Voyage from Vicksburg to Memphis. — Monotony of River Scenery. — Squall of Wind. — Actors on Board. — Negro mistaken for White. — Manners in the Backwoods. — Inquisitiveness. — Spoilt Children. Equality and Levelling. — Silence of English Newspapers on Oregon Question.

March 15. 1846.—From Natchez we crossed the river, by the ferry, to Vidalia, situated on the low river plain, on a level with the base of the bluffs before described. We were accompanied by Mr. Davis, a large proprietor, who took us to see his negro-houses, all neatly built and well whitewashed. Even in this cursory view we could perceive how much the comfort and bodily wants of the slaves had been attended to. We had now left the country where sugar and cotton are the staple products, and had just entered the region where cotton and Indian corn are cultivated together. Here, as in Louisiana, the negroes constitute half, and sometimes more than half, the population on the borders of the Mississippi.

At Vidalia we were joined by Mr. Forshey, the engineer, who went with us to Lake Concordia, a fine example of an old bend of the Mississippi, recently detached and converted into a crescent-shaped lake, surrounded by wood. It is a fine sheet of water, fifteen miles long, if measured by a curved line drawn through the middle. The old levee, or embankment, is still seen; but it is no longer necessary to keep it in repair, for, a few years ago, the channel which once connected this bend with the main river was silted up. Opposite Natchez the depth of the Mississippi varies from 100 feet to 150 feet, but Lake Concordia has nowhere a greater depth than 40 feet. There are thirteen similar lakes between the mouth of the Arkansas and Baton Rouge, all near the Mississippi, and produced by cut-offs; and so numerous are the channels which communicate from one to the other, that a canoe may pass, during the flood season, from Lake Concordia, and reach the Gulf of Mexico without once entering the Mississippi. We were shown a cypress tree on the borders of this deserted river bend, from under the roots of which, a few days before the time of our visit, a she alligator had come out on a warm day, the place of her hybernation appearing to be half in the mud and half in the water. She brought out with her two broods, one born in the preceding summer, which were six inches long, and the others, an older set, about a foot long. When Mr. Forshey approached them, the young ones yelped like puppies, and the old one hissed. On the shore of the lake we caught a tortoise, called here the snapping-turtle, and found that all its feet had been bitten off,—devoured, our companions supposed, by predaceous fish. The freshwater shells, of which we obtained specimens from the lake, belong to the genera *Lymnea*, *Planorbis*, *Paludina*, *Anculotus*, *Physa*, *Cyclas*, and *Unio*. We put up flights of water-fowl of various species, chiefly wild ducks, which were swimming about. On the top of a pole, driven into the mud near the margin of the lake, was perched a kingfisher, and two cormorants were wheeling round it, one with a fish in its mouth, which the other was trying to snatch away. The water, although much clearer than the Mississippi, was not transparent, for it had communicated, during the late inundations, with the great river. In this manner sediment is annually introduced into such basins, and in the course of ages Lake Concordia may become so shallow as to support a forest of swamp timber. Some modern concretions of clay and lime, and of clay containing iron, which I picked up from the mud of the Mississippi bordering this lake, were so like those associated with the ancient buried forest at Port Hudson, and the shelly loam of Natchez, as to confirm me in the opinion before expressed, that the cliffs there, although of very high antiquity, correspond in origin with the recent fluviatile formations of the alluvial plain.

March 17.—We established ourselves in the wharf-boat at Natchez, prepared for a start in the first steamer which would take us to Grand Gulf, fifty miles higher up. We amused ourselves by watching a party of young negro boys, who collected the drift wood which bordered the river, and, having tied it together into a raft, heaped some dead branches of trees upon it, placing a layer of shavings under the pile. Having set it on fire, they pushed it off from the shore, and exulted as they saw the floating bonfire, in the dusk of the evening, throwing a glaring light on the bluffs, town, and shipping. The raft was carried round and round in the great eddies near the bank, and the urchins shouted when their love of mischief was gratified by seeing the alarm of the boatmen, each of whom was observing the wandering fire with some anxiety, lest it should come too near his own craft. In the cabin of the wharf-boat we found no furniture, but were supplied with two chairs, which, like the walls and ceiling, were of unpainted wood. As it grew dark, they brought in a table and a single candle. We were not sorry when the Peytona was announced, and we were ushered into a splendid saloon, 150 feet long, lighted by two large chandeliers suspended from the ceiling, and supplied with brilliant gas manufactured on board. The mattrasses of our beds were elastic, made of India rubber, no unmeaning luxury, for we were awakened before morning by the bumping of the boat against one floating log after another, and, in spite of the frequent stoppage of the engine, no small damage was done to the paddle-wheels, which got entangled with the drift timber. We reached Grand Gulf when morning had scarcely dawned, and found the floor of the saloon covered with the sleeping coloured servants, over whom we had to step. The river had risen twenty-five feet in two days, and was more turbid than we had yet seen it.

The bluff at Grand Gulf is about 180 feet high, the uppermost 60 feet, composed, as at Natchez, of yellow loam or loess, beneath which was white quartzose sand, partially concreted into solid sandstone, which is quarried here for building. From the summit the river-plain to the westward seemed as level, blue, and boundless as the ocean. As we had now travelled two degrees of latitude northward, the spring was not more advanced than when we left New Orleans, but the woods crowning the bluffs are beautiful from the variety of trees, many of them evergreens, and we were charmed with the melody of the mocking-birds, and the warm sun brought out many large and brilliantly coloured butterflies, and more insects of other kinds than I had yet seen in the south. Among these were a beetle (*Phaneus carnifex*), with green and gold wing-cases, and a horn on the thorax. The name of bug is given to all beetles (*Coleoptera*) here, and does not seem to awaken the same unpleasant associations as it suggests to English ears. Even the elegant fire-fly is called a lightning-bug, and ladies who have diamond beetles set in brooches, ask you to admire their beautiful bugs. The Londoners, by way of compensation, miscall the cockroach a black beetle.

From Grand Gulf, we embarked in the Magnolia, which had brought my wife to Natchez, and, having since made a trip to St. Louis and New Orleans, was on its return up the river. It is a new boat, and, among other improvements, has a separate sleeping cabin for the coloured servants. The furniture in the principal saloon is of fine Utrecht velvet, and the hanging lustres for gas very brilliant: the beds excellent; but the powerful vibration caused by the machinery far from agreeable. Our state room contained a chest of drawers, and cupboards for hanging up ladies' dresses. Ample time was allowed for dinner, and we thought the fare only too sumptuous. The repast began with turtle soup, and two kinds of fish; then followed a variety of made dishes, admirably cooked, and then a course of cocoa-nut pies, jellies, preserved bananas, oranges, grapes, and ice-creams, concluding with coffee. The claret was excellent, and it may seem strange, at first, that they who indulge in such luxuries, can drink freely of the opaque, unfiltered water of the Mississippi. But this fluid has, at least, the merit of being cool on a hot day, and is believed to be very wholesome. We found it pleasant to the taste, however untempting to the sight. Few of the praises bestowed by Denham on the Thames can be lavished on the Mississippi; for, though deep, it is not clear, nor is it "without o'erflowing, full." Yet, in spite of the occasional undermining of forests on its banks, it may be truly characterised as "strong, without rage;" absorbing, as it does, in its course, one great tributary after another, several of them scarcely inferior in width to itself, without widening its channel, and in this manner carrying down noiselessly to the sea its vast column of water and solid matter, while the greater part of its alluvial plain is left undisturbed.

A settler at Natchez told us he had lived on the great river long enough to admire it, for the ease with which it performs its mighty work; and to fear it, so often had he witnessed the wreck of vessels and the loss of lives. "If you fall overboard," he said, "in the middle of the Atlantic, you may rise again and be saved; but here you are sucked down by an eddy, and the waters, closing over you, are so turbid, that you are never seen again."

March 19.—At Vicksburg, where we next landed, I found the bluffs, forming the eastern boundary of the great plain, similar, in their upper part, to those of Natchez; but beneath the freshwater loam and sand were seen, at the base of the cliffs, a marine tertiary deposit, of the Eocene period, in which we collected many shells and corals. (See fig. 10. p. 257; and 3. fig. 11. p. 262.)

Leaving my wife to rest at the hotel, I made a rapid trip by railway, fifty-five miles eastward, to Jackson, the capital of the State of Mississippi. For the first ten miles, the cars traversed a table-land, corresponding in height with the summit of the bluff at Vicksburg, and preserving an even surface, except where gullies had been hollowed out in the soft shelly loam or loess. These are numerous, and it had been necessary to throw bridges over many of them so as to preserve the level of the road. It was curious to observe, in the cuttings made through the loam, that each precipitous face retained its perpendicularity, as in natural sections, although composed of materials wholly unconsolidated. Farther to the east, the Eocene strata, belonging to the same series, which are seen at the bottom of the bluffs at Vicksburg, rise up to the surface from beneath the freshwater loam, which attains an elevation of about 250 feet above the sea, and then gives place to older rocks.

We passed through large forests of oaks and beeches, just coming into leaf, in which where some green hollies. The red-bud, in blossom, was conspicuous in some of the woods. In the wet grounds were cane-brakes, willows, and magnolias. I observed, in a large clearing, three ploughs following each other, one guided by a man, and the others each by a negro woman. When we reached the Big Black river, twelve miles from Vicksburg, we passed over a long wooden bridge and viaduct, built on piles nearly a mile in length. In about four hours, we arrived at the town of Jackson. I was wholly without letters of introduction, having suddenly determined on this excursion, and knew not the name of a single individual; which I regretted the more, as I had only a few hours of daylight at my disposal, and was to return by the cars at noon the day following. I inquired, as I had often done in France on similar occasions, for the nearest *pharmacien*, or chemist, and, being shown to a shop, asked if they knew any one who was interested in geology. The chemist informed me that Dr. Gist, a physician, lodged in the floor above, and might assist me. Fortunately, this gentleman was at home, and, telling me he had read my work on Geology, he presented me with some fossil shells and corals collected by him in the neighbourhood; and, within ten minutes of my "landing" from the cars, we were on our way together to explore the dried up channel of a small tributary of the Pearl River, where I found a rich harvest of fossil marine shells and zoophytes. When we parted, my excellent guide agreed to accompany me, early the next morning, many miles in another direction.

On entering my hotel, after dark, I was informed that supper was ready, and was conducted to a large ordinary crowded chiefly by lawyers, who were attending the Courts here. The landlord, General A——, formerly of the Tennessee militia, played the part of master of the ceremonies, much to my amusement. He first obtained silence by exclaiming, with the loud voice of a herald, "Gentlemen, we are a great people," and then called out the names of all the viands on his long table and sideboard, beginning with "Beef-steak, with or without onions, roast turkey, pork, hominy, fish, eggs," &c., and ending with a list of various drinkables, the last of which was "tea, foreign and domestic." Curiosity led me to order the last-mentioned beverage; but I soon repented, finding it to be a liquid of a pink colour, made of the root of the sassafras tree, and having a very medicinal taste. I was told that many here drink it for their health; but the General, seeing that I did not relish it, supplied me with some good "foreign" tea. My host then introduced me to several of the lawyers who sat near me, which gave me an opportunity of asking whether there was any truth in the story told me by some of the Whigs at New Orleans, of the manner in which the Seat of Legislature had been transferred from Natchez to Jackson. I related the story, which was as follows: —"Natchez was the metropolis of the State, and the chief town of Adams county, which was so wealthy as to pay a third of all the taxes in Mississippi. It was a city to which the richest and best-informed citizens resorted, representing both the landed and monied interests of the State. It was, moreover, a centre of communication, because it commanded the navigation of the great river. That the Houses of Legislature should meet here was so natural and convenient, so fitted to promote good government, that the democratic party could not be expected to put up, for many years, with an arrangement of affairs so reasonable and advantageous. They accordingly decided, by a majority, that some change must be made, and gave orders to a surveyor to discover the exact geographical centre of the State. He found it in a wilderness, about fifty miles in a straight line east of Natchez, and pointed out an old cypress tree in the middle of a swamp, accessible only by a canoe, as the spot they were in search of. This was welcome news; all might now be placed on a footing of equality, the spot being equally inaccessible and inconvenient for all. When the architect, however, came to build the Capitol, he took the liberty, instead of erecting the edifice on piles in the centre of the swamp, to place it on an adjoining rising ground, from which they had cleared away the native wood, a serious abandonment of principle, as it was several hundred yards from the true geographical centre."

When my auditors had done laughing at this Louisiana version of a passage in their history, they said, the tale, after all, was not so exaggerated as it might have been, considering the vexation under which the New Orleans Whigs were smarting, in having to go to Baton Rouge. They could show me, they said, the swamp on the Pearl River, which must have been alluded to. That river, though now only boatable, might, they declared, be made navigable to steam-boats, when the rafts of drift timber were cleared away, and they might then have a direct commercial intercourse with the Gulf of Mexico. The soil, also, surrounding Jackson, had proved to be very fertile, and the railway had brought the place within three or four hours of Natchez, now their port. In short, their town was flourishing, by aid of natural advantages, and the patronage of the Legislature and Law Courts.

Next day, after a geological excursion, I was taken to see the State House and Governor's mansion, both handsome and commodious, and built in a good style of architecture, but at great expense, at a time when the price of labour happened to be unusually high. I heard much regret expressed at the debts they had incurred, and at the refusal to acknowledge them in 1841. One lawyer, a member of the Legislature, declared his conviction that the repudiation of the State debt would not have been carried in his county, but for the facility afforded by secret voting. The same individuals, he said, who openly professed a more honourable line of conduct, must, out of selfishness, have taken advantage of the ballot-box to evade an increase of taxation, otherwise there could not have been a majority in favour of disowning their liabilities. This was one of the few instances in which I heard the ballot condemned in the United States; yet the position of the labouring and middle classes is, comparatively, so independent here, in relation to their rich employers, that the chief arguments relied upon in England in favour of secret voting, would seem to be inapplicable.

The dependence of the judges, for their election, on the popular suffrage, appears to have been carried farther in Mississippi than in any other State. I was told that rival candidates for the bench and chancellorship, have been known to canvass for votes in taverns, and have been asked what construction they put on certain statutes relating to banks chartered by the State, just as, in an ordinary election for representatives, men are asked what are their opinions, and how they would vote on certain questions. I met with more men of property in Mississippi who spoke as if they belonged to an oppressed class, governed by a rude, ignorant, and coarse democracy, than in any other part of my tour. "Many of our poorest citizens, they said, would freely admit, that nothing is so difficult, for the individual, as self-government, and yet hold that nothing is so easy and safe as self-government for the million, even where education has been carried no farther than here, where there are still seven counties without a single school-house, and large districts where the inhabitants have but recently been converted to Christianity by itinerant Methodists. They forget that even honourable and enlightened men will sometimes do, in their corporate capacity, what each individual would be ashamed to do if he acted singly." When I heard these remarks, and reflected that even in those parts of the State where the whites are most advanced, as in Adams county, more than half the population are slaves, I felt more surprise that English capitalists had lent so much money to Mississippi, than that they had repented of it. At the same time there is more hope for the future, for education must come.

The town of Vicksburg is beautifully situated on the slope of a wooded bluff, about 180 feet high, and walks might be made, commanding the river, which would be delightful. At present no one can roam along the paths in the suburbs, as they are disgracefully filthy.*

We took our passage in the Andrew Jackson steamer, from Vicksburg to Memphis, a distance of 390 miles, and paid only six dollars each (25 shillings), board and lodging included. The monotony of the scenery on the great river for several hundred miles together, is such as to grow wearisome. Scarcely any vessels with sails are seen, all the old schooners and smaller craft having been superseded by the great steam-ships. The traveller becomes tired of always seeing a caving bank on one side, and an advancing sand-bar, covered with willows and poplars, on the other; the successive growths of young trees rising to greater heights, one tier above another, as before described, below New Orleans. The water, at this season, is too turbid to reflect the sky or the trees on its bank. The aspect of things, day after day, is so exactly similar, that it might seem as necessary to take astronomical observations, in order to discover what progress one has made, as if the voyage were in mid-Atlantic. That our course is northward, is indicated by the willows on the banks growing less green, and a diminishing quantity of grey moss hanging from the trees. The red maple has also disappeared. When I landed at wooding stations, I saw, on the damp ground beneath the trees, abundance of mosses, with scarcely a blade of grass, while the only wild flowers were a few violets and a white bramble. The young leaves of the poplars are most fragrant in the night air. We were now in latitude 34° north, passing the mouths of the Arkansas and White rivers.

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* For observations on the Geology of Jackson and Vicksburg, see a paper by the author, Journ. of Geol. Soc. London, vol. iv. p. 15. 1847, and Silliman's Journal, Second Series, vol. iv. p. 186. Sept. 1847.

The village of Napoleon, 212 miles above Vicksburg, at the mouth of the Arkansas, had suffered much by the floods of 1844. Its red, muddy waters are hardly mixed up thoroughly with the Mississippi till they reach Vicksburg. They often bring down much ice into the Mississippi. The White river is said to be navigable for about six hundred miles above its mouth.

Our steamer, the Andrew Jackson, bound for Cincinnati, carrying a heavy cargo of molasses, was eight feet deep in the water. To avoid the drift wood, which impeded her progress, the captain, on arriving at Island Eighty-four (for they are all numbered, beginning from the mouth of the Ohio), determined to take a short cut between that island and the left river bank. The lead was heaved, and the decreasing depth, from ten feet to eight and a half, was called out; our vessel then grazed the bottom for a moment, but fortunately got off again. There was so much sameness in the navigation, that such an incident was quite a relief. Soon afterwards, March 23d, some variety was afforded by a squall of wind, accompanied by lightning. I never expected to see waves of such magnitude, and was surprised to learn, that in some reaches, where the water extends ten miles in a straight line, a strong wind blowing against the current will cause large steamers to pitch so as to make many passengers sea-sick; but this rarely happens. In the night we had often to draw up to the bank, wherever a signal-fire was lighted, finding sometimes a single passenger waiting to be taken on board.

There were many actors on board, and, among others, a pleasing young woman, who turned out to be the manager's wife, returning with her family of young children and sick husband from Vicksburg, where she complained that the drama was at a low ebb, and where, as in many other cities in the South, the drunken habits of the inferior actors made the profession by no means a pleasant one for a woman. She was longing for an engagement in some "Eastern theatre," where, she told my wife, she would willingly take less pay, and would not object to undertake the part of "first old woman" for eighteen dollars a week, as most of the actresses, being desirous of looking young and pretty, compete eagerly for the character of "first juvenile." She liked much to act chambermaid, as then she was not expected to learn her part so accurately. She had a real feeling of enthusiasm for her art, and great admiration for

Mrs. Kean, and spoke with satisfaction of having once acted second to her when she was Miss Ellen Tree. During her husband's illness at Vicksburg, she had been obliged to take the management of the theatre herself, and had good reason to lament that the temperance movement had not reached so far west. The physician, after attending his patient for many weeks in a fever, remitted to them a bill of fifty dollars, one only of many similar acts of generosity in the members of this profession which came to my knowledge in the course of my tour. This actress had with her a young maid, fairer than many an English brunette, but who, though a free woman, did not happen to belong to the white aristocracy. The stewardess came into the cabin and summoned her to dinner, and she, doing as she was bid, sat down at the second table, where the officers of the ship and the white children were dining. When her repast was half finished, her master and mistress suddenly discovered the prodigious breach of decorum which their attendant was perpetrating, and, calling her away from the table, began explaining to one lady after another, especially those with whose children she had been sitting, that she was really a good girl, who knew no better. The stewardess also, knowing she should incur blame, came and apologised for her mistake, observing that the girl was quite undistinguishable by her complexion from a white. There was a quadroon lady on board, of very respectable appearance and manners, who was taking all her meals in her own state-room, thus avoiding the risk of meeting with similar indignities. It is not surprising, in such a state of society, that they who belong to the degraded race, should make every effort to conceal the fact; or, if that be impossible, to assimilate themselves, as far as they can, to individuals of the dominant race. In proportion to the mixture of white blood, the woolly, short hair of the negro lengthens and straightens, and the ambition of the black women is to contend with nature in torturing their hair, by combing and plaiting, till it resembles, as near as possible, the flowing locks of the whites.

At one of the wooding stations, a countryman came on board with his wife, a half-bred Indian. She had straight black hair, and a soft mild eye. She sat at table with us, taking her place on terms of perfect equality, no distinction of caste being made in this case.

As I was pacing the deck, one passenger after another eyed my short-sight glass, suspended by a riband round my neck, with much curiosity. Some of them asked me to read for them the name inscribed on the stern of a steamer so far off that I doubted whether a good telescope would have enabled me to do more than discern the exact place where the name was written. Others, abruptly seizing the glass, without leave or apology, brought their heads into close contact with mine, and, looking through it, exclaimed, in a disappointed and half reproachful tone, that they could see nothing. Meanwhile, the wives and daughters of passengers of the same class were sitting idle in the ladies' cabin, occasionally taking my wife's embroidery out of her hand, without asking leave, and examining it, with many comments, usually, however, in a complimentary strain. To one who is studying the geology of the valley of the Mississippi, the society of such companions may be endurable for a few weeks. He ought to recollect that they form the great majority of those who support these noble steamers, without which such researches could not be pursued except by an indefinite sacrifice of time. But we sometimes doubted how far an English party, travelling for mere amusement, would enjoy themselves. If they venture on the experiment, they had better not take with them an English maid-servant, unless they are prepared for her being transformed into an equal. It would be safer to engage some one of that too numerous class, commonly called "humble companions," who might occasionally enter into society with them. Ladies who can dispense with such assistance, will find the maids in the inns, whether white or coloured, most attentive.

We were not asked more questions in regard to our private affairs than we had often been accustomed to submit to when travelling in France and Scotland. Nor had I any reason to complain; for when I had satisfied the curious as to my age, the number of my children, how we liked the country, and many other particulars, often asked very abruptly by one just come on board, I had no ceremony in retaliating on him, and putting to him as many queries in my turn. Every one must admit that the answers you commonly receive are most intelligent. Americans of the higher classes seemed more put out than we were, when thus catechized.

One of them, before we left Boston, as if determined that nothing should surprise us, related many diverting anecdotes to illustrate the inquisitive turn of his countrymen. Among other stories he gave a lively description of a New Englander who was seated by a reserved companion in a railway car, and who, by way of beginning a conversation, said, "Are you a bachelor?" To which the other replied, dryly, "No, I'm not."—"You are a married man?" continued he.—"No, I'm not."—"Then you must be a widower?"—"No, I'm not." Here there was a short pause; but the undaunted querist returned to the charge, observing, "If you are neither a bachelor, nor a married man, nor a widower, what in the world can you be?"—"If you must know," said the other, "I'm a divorced man!"

Another story, told me by the same friend, was that a gentleman being asked, in a stage coach, how he had lost his leg, made his fellow travellers promise that if he told them they would put no more questions on the subject. He then said, "It was bitten off." To have thus precluded them for the rest of a long journey from asking how it was bitten off, was a truly ingenious method of putting impertinent curiosity on the rack.

When my wife first entered the ladies' cabin, she found every one of the numerous rocking-chairs filled with a mother suckling an infant. As none of them had nurses or servants, all their other children were at large, and might have been a great resource to passengers suffering from ennui, had they been under tolerable control. As it was, they were so riotous and undisciplined, as to be the torment of all who approached them. "How fortunate you are," said one of the mothers to my wife, "to be without children; they are so ungovernable, and, if you switch them, they sulk, or go into hysterics." The threat of "I'll switch you," is for ever vociferated in an angry tone, but never carried into execution. One genteel and pleasing young lady sat down by my wife, and began conversation by saying, "You hate children, don't you?" intimating that such were her own feelings. A medical man, in large practice, in one of the Southern States, told us he often lost young patients in fevers, and other cases where excitement of the nerves was dangerous, by the habitual inability of the parents to exert the least command over their children. We saw an instance where a young girl, in considerable danger, threw the medicine into the physician's face, and heaped most abusive epithets upon him.

The Director of the State Penitentiary, in Georgia, told me, that he had been at some pains to trace out the history of the most desperate characters under his charge, and found that they had been invariably spoilt children; and, he added, if young Americans were not called upon to act for themselves at so early an age, and undergo the rubs and discipline of the world, they would be more vicious and immoral than the people of any other nation. Yet there is no country where children ought to be so great a blessing, or where they can be so easily provided for. Parents have not the excuse of Mrs. Mac Clarty, in the "Cottagers of Glenburnie," when she exclaims, "If I don't give the boy his own way, what else have I to give him?" but it is probably because so many of these Western settlers have risen recently from Mrs. Mac Clarty's grade in society, that they have retained her maxims for the management of their children; for the young people in the families of the best class of society in the United States, are often kept in as good order, and are as engaging in their manners, as they are in any part of Europe.

Many young Americans have been sent to school in Switzerland, and I have heard their teachers, who found them less manageable than English or Swiss boys, maintain that they must all of them have some dash of wild Indian blood in their veins. Englishmen, on the other hand, sometimes attribute the same character to republican institutions; but, in fact, they are spoilt long before they are old enough to know that they are not born under an absolute monarchy.

Some officers of the army, who had been educated at Westpoint, a lieutenant in the navy, and a judge, with his family, from a Southern State, were agreeable companions on this voyage, and differed as much in manners, from the majority of our messmates, as persons of the same rank in Europe would have done. There seemed, to us, to be a great want, in such steamers, of a second cabin, at a price intermediate between that of the first cabin and the deck. A poor emigrant, who was roughing it in the latter place, remarked to me truly, that they were treated there like dogs, and had nothing but a plank to sleep upon. He was paying highly for his wife and family, who had places in the first cabin. Among all who have paid for these, a recognition of perfect equality is scrupulously exacted. Not only would a man of rank or ancient family, but one of the most refined manners, and superior knowledge and education, find himself treated as entitled to no more deference or respect than the rudest traveller. Plato's definition of a man, "bipes implume," "a featherless biped," would be most appropriate to one who was journeying in such company. To a certain extent, however, the manners of the ruder members of this society are improved by such intercourse, and there is some levelling up as well as levelling down. The European traveller must also bear in mind, that it would be no discredit to those who are settling in this wilderness —especially when Europe pours into it, annually, her hundreds of thousands of ignorant and disappointed emigrants—if the accommodation was of the rudest kind; if there were no steamers in whose machinery the latest improvements had been adopted, many of them invented in the United States; and if the cabin was not provided with good libraries, or the table covered with newspapers, literary magazines, and reviews. It is precisely because there is so much civilization in the Western States that foreigners criticise them unfairly, contrasting their condition with the highest standard of older countries.

The authority of the captain is absolute, and he does not hesitate, if any unruly spirit is refractory, and refuses to conform to the regulations of the ship, to put him ashore at the nearest place on the bank where he can be landed; but I never happened to see so strong a measure resorted to.

The newspapers on the cabin table of the Andrew Jackson had a column headed in capitals, "Five Weeks later from Europe." The mail packet had been detained by adverse winds longer than usual, and the uneasiness respecting the chances of a war with England, still the subject of debate in Congress, had risen to a great height. Many lovers of peace had misgivings lest the English democracy, growing at last impatient, should express themselves with violence, and excite the war party here. The first glance at the news relieved them from anxiety, for the English were entirely absorbed with Free Trade, Cheap Bread, and the admission of foreign grain without duty. The Cabinet were too well satisfied that the people's attention was drawn off from foreign affairs to obtrude the American question unnecessarily on their attention. One of the politicians on board, who had been reading an account of the proceedings of the Anti-Corn-Law League, and the parliamentary debates on the Corn Duties, confessed to me, that the omission of all allusion to America—the English being so entirely occupied with their domestic affairs—wounded his feelings. "Here we have been talking," he said, "for three months about nothing else but Oregon, imagining that the whole world was looking on, in suspense, at this momentous debate, and even in Great Britain it has been forgotten for five entire weeks! What an absurd figure we are cutting!"

CHAP. XXXIII.

Bluffs at Memphis.—New Madrid.—No Inn.—Undermining of River Bank.—Examination of Country shaken by Earthquake of 1811-12.—*Effects of Passage of Waves through Alluvial Soil.—Circular Cavities or Sand-Bursts.—Open Fissures.—Lake Eulalie drained by Shocks.—Borders of Sunk Country, West of New Madrid.—Dead Trees standing erect.—A slight Shock felt.—Trade in Peltries increased by Earthquake.—Trees erect in new-formed Lakes.—Indian Tradition of Shocks.—Dreary Forest Scene.—Rough Quarters.—Slavery in Missouri.*

March 24. 1846.—AT length we reached Memphis, in the State of Tennessee. The town on which this ancient and venerable name is conferred appears the newest of the large places we have yet seen on the Mississippi. It is growing with great rapidity, standing on a bluff now fifty-two feet above the level of the water when the river is high. The cliff is the abrupt termination of deposits similar to those of freshwater origin, which I have before alluded to at Natchez and Vicksburg. A mass of yellow loam, forty feet thick, reposes on sand with quartz pebbles, which rests on clay, not visible at the time of my visit. Such a site for a town, in spite of the slow undermining of the cliffs, is permanent, by comparison with the ordinary banks of the river for hundreds of miles continuously; for, as a general rule, the stream in the alluvial plain is either encroaching a foot or more annually, so as to wash away buildings, if there be any on the bank, or is retreating, so that a port soon becomes an inland town. The people of Memphis are ambitious that their city should be a great naval arsenal, and there are considerable naval stores here; but as frigates require from eighteen to twenty-three feet water, and men-of-war thirty feet, while the bar at the mouth of the Mississippi affords at present no more than sixteen feet water, their hopes cannot be realised till a ship canal is made from some point on the Mississippi to the Gulf of Mexico.

After we left Memphis, we were shown, on the Tennessee bank of the river, a log cabin, where they said General Jackson began his career; one of his claims to popularity with the democratic party consisting in his having risen from a very humble origin. The advantages of a more liberal education, which a rival might have possessed who had begun life in easier circumstances, would not have countervailed, in the present stage of progress of the Union, the prestige which attaches to the idea of a man's having made his way by his own merits.

March 25.—From Memphis we sailed in a smaller steamer for 170 miles, first between the States of Tennessee and Arkansas, and then between Tennessee and Missouri, and arrived very late at night at New Madrid, a small village on the western bank of the river, where I intended to stay and make geological observations on the region shaken by the great earthquake of 1811–12. So many of our American friends had tried to dissuade us from sojourning in so rude a place, that we were prepared for the worst. In the wharf-boat, at least, I expected to find a bed for the first night, and proposed to seek accommodation elsewhere the next day; but, to my dismay, the keeper of this floating tavern told me, when I landed, that he had just come there, had nothing as yet "fixed," and could not receive us. I also learnt that the only inn in New Madrid had been given up for want of custom. Leaving, therefore, my wife sitting by the stove in the wharf-boat, and taking a negro as my guide, I began to pace the dark and silent streets. First I applied in vain for admittance at the old tavern, then to a store-keeper in the neighbourhood, who informed me that a German baker, near the river, sometimes took in lodgers. I next roused this man and his wife from their slumbers; their only spare room was occupied, but they asked their lodger if he would give it up to us. No sum of money would have bribed him to comply, as I was satisfied when I knew him better, but his good nature led him at once to assent cheerfully. We were soon shown into the apartment, a kind of scullery, with a mattrass on the floor, on which we slept, and did not make our appearance next morning till half past eight o'clock. We then apologised, fearing we had kept them waiting for breakfast. They said, good humouredly, they had indeed waited from six o'clock, and it was now near their dinner time! The young German, originally from near Strasburg, a man of simple manners, regarded himself as belonging to a different station in society, and would have acted as waiter till we had finished our repast, had not his wife, a native-born American from the State of Indiana, insisted on his sitting down to table. They were so poor, that they had no servants, not even a negro boy or girl, and two children to look after. The fare was of the humblest kind, bread of Indian corn, bacon, and thick coffee. Some of the indispensable articles of the breakfast table equipage had been purchased, as we afterwards discovered, expressly for our use that morning. The lodger, "Uncle John," was an old bachelor in easy circumstances, fond of fishing, who had come here to indulge in that sport. He was an old pilot, who had visited half the ports in the Mediterranean, as well as Great Britain, and was quite a character. He could tell many a good story of his adventures, and, like many natives of Louisiana, could bear to be contradicted on any point rather than hear the healthiness of New Orleans called in question. His manners, and those of our host and hostess towards each other and to us, were very polite, and never approached undue familiarity. Uncle John assured me that the Mississippi is now flowing where New Madrid stood in 1811, and that the old graveyard has travelled over from the State of Missouri into Kentucky. How this had happened, it was easy for me to divine when I went out after breakfast to look at the place by daylight.

The river bank is now about twenty-five feet high, and would be forty-five feet at the lowest water level. It is giving way rapidly, three houses having fallen in during the last week, and some proprietors are in the act of shifting their quarters half a mile inland. At the bottom of the wasting bank, there is a semi-fluid quick-sand, which greatly accelerates the process of destruction. Yesterday, the ruins of a house, with the wooden fence of a garden, were precipitated into the river, and some of the wreck has formed a talus, up which I saw some hogs, after several unsuccessful attempts, clamber at last into a garden, where they began to uproot the flowers. The steam-boats, which are now sailing close to the bank, will in a few years pass freely over the site of the humble mansion where we had been sleeping; and the geographer, in constructing a map half a century hence, may have to transfer to the State of Kentucky the spot where I saw a garden flourish.

I examined the perpendicular face of the bank with some interest, as exemplifying the kind of deposits which the Mississippi throws down near its margin. They differ in no way from accumulations of sand and loam of high antiquity with which the geologist is familiar; some beds are made up of horizontal layers, in others they are all slanting, or in what is called cross-stratification. Some are white, others yellow, and here and there a seam of black carbonaceous matter, derived apparently from the destruction of older strata, is conspicuous.

I next set out on an excursion to examine those districts, where I heard that some superficial effects of the great earthquake of 1811 were still visible. The reader should be reminded that this convulsion occurred contemporaneously with one of the most fatal earthquakes of South America, when the towns of Guayra and Caraccas were laid in ruins. The shocks were also felt in South Carolina. Humboldt has remarked that the shocks of New Madrid are the only examples on record, of the ground having quaked almost incessantly for three months, at a point so far remote from any active volcano. The shocks were most violent in part of the region called the Little Prairie, to the southward of New Madrid, and they extended as far south as the River St. Francis, and, northward, as far as the mouth of the Ohio. Although the country was thinly settled, and most of the houses built of logs, the loss of life was considerable. From accounts published at the time, it appears that the grave-yard of New Madrid was precipitated into the Mississippi, the banks of which gave way in many places, and the ground swelled up so that the current of the river flowed backwards for a time, carrying several flat boats northwards, against the stream. In various parts of the region above alluded to as having been convulsed, lakes twenty miles and upwards in extent were formed, while others which pre-existed were drained.* Hundreds of chasms opened, and new islands appeared in the Mississippi and its tributaries. Flint, the geographer, who visited the country seven years after the event, says that, at the time of his visit, a district west of New Madrid still remained covered with water, and that the neighbouring forest presented a scene of great confusion,—many trees standing inclined in every direction, and others having their trunks and branches broken. He also saw hundreds of deep chasms remaining in the alluvial soil, which were produced, according to the inhabitants, by the bursting of the earth, which rose in great undulations, and discharged vast volumes of water, sand, and coaly matter, thrown up as high as the tops of the trees. As the shocks lasted throughout a period of three months, the country people remarked that, in given districts, there were certain prevailing directions in which these fissures opened, and they accordingly felled the tallest trees, making them fall at right angles to the direction of the chasms. By stationing themselves on these, they often escaped being swallowed up when the earth opened beneath them. Some of the shocks were perpendicular, while others, much more desolating, were horizontal, or moved along like great waves.

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* Silliman's Journ., vol. xv. 1829.

Before I left New Orleans, Mr. Bringier, the engineer, related to me that he was on horseback near New Madrid, in 1811, when some of the severest shocks were experienced, and that, as the waves advanced, he saw the trees bend down, and often, the instant afterwards, when in the act of recovering their position, meet the boughs of other trees similarly inclined, so as to become interlocked, being prevented from righting themselves again. The transit of the wave through the woods was marked by the crashing noise of countless branches, first heard on one side and then on the other. At the same time, powerful jets of water, mixed with sand, mud, and pieces of bituminous coaly shale, were cast up with such force, that both horse and rider might have perished, had the undulating ground happened to burst immediately beneath them. He also told me that circular cavities, called sink-holes, were formed where the principal fountains of mud and water were thrown up.

Hearing that some of these cavities still existed near the town, I went to see one of them, three quarters of a mile to the westward. There I found a nearly circular hollow, ten yards wide, and five feet deep, with a smaller one near it, and I observed, scattered about over the surrounding level ground, fragments of black bituminous shale, with much white sand. Within a distance of a few hundred yards, were five more of these "sand-bursts," or "sand-blows," as they are sometimes termed here, and, rather more than a mile farther west, near the house of Mr. Savors, my guide pointed out to me what he called "the sink-hole where the negro was drowned." It is a striking object, interrupting the regularity of a flat plain, the sides very steep, and twenty-eight feet deep from the top to the water's edge. The water now standing in the bottom is said to have been originally very deep, but has grown shallow by the washing in of sand, and the crumbling of the bank caused by the feet of cattle coming to drink. I was assured that many waggon loads of matter were cast up out of this hollow, and the quantity must have been considerable to account for the void; yet the pieces of lignite, and the quantity of sand now heaped on the level plain near its borders, would not suffice to fill one-tenth part of the cavity. Perhaps a part of the ejected substance may have been swallowed up again, and the rest may have been so mixed with water, as to have spread freely like a fluid over the soil.

My attention was next drawn to the bed of what was once a lake, called Eulalie; Mr. W. Hunter, the proprietor of the estate, accompanying me to the spot. The bottom, now dried up, is about 300 yards long by 100 yards in width, and chiefly composed of clay, covered with trees, the whole of them less than thirty-four years old. They consist of cotton-wood (*Populus angulata*), willows, the honey locust, and other species. Some single cotton-wood trees have grown so fast as to be near two and a half feet in diameter, and had not my guide known their age accurately, I should have suspected their origin to have been prior to 1811. All the species on the bottom differ from those covering the surrounding higher ground, which is more elevated by twelve or fifteen feet. Here the hickory, the black and white oak, the gum, and other trees, many of them of ancient date, are seen to flourish. On all sides, the ascent from the old bed of the lake to its boundary, is by a steep slope, on ascending which you reach a platform on a level with the top of the bank of the Mississippi which is about a mile distant. Mr. Hunter informed me that Lake Eulalie was formerly filled with clear water, and abounded in fish, until it was suddenly drained by the earthquake. In the clayey bottom, I traced the course of two parallel fissures, by which the waters escaped. They are separated from each other by a distance of about eight yards, and are not yet entirely closed. Near their edges, much sand

and coal shale lie scattered, which were thrown out of them when they first opened.

In regard to the origin of this black bituminous shale, so abundantly cast out of chasms in this region, it belongs to the alluvial formation, and is found, in digging wells, fifteen feet deep, or sometimes nearer the surface. It was probably drifted down at a former period by the current of the Mississippi, from the coal-fields farther north.

Having learnt that still more striking monuments of the earthquake were to be seen in the territory farther to the westward of New Madrid, I endeavoured, but in vain, to hire a horse. At length a merchant's widow kindly lent me a steed. To procure a guide was impossible, all hands being fully employed. I therefore set out alone through the forest, skirting the borders of a swamp called the Bayou St. John, where I observed a great many fallen trees, and others dead and leafless, but standing erect. After riding some miles, I found my way to a farm, the owner of which had witnessed the earthquake when a child. He described to me the camping out of the people in the night when the first shocks occurred, and how some were wounded by the falling of chimneys, and the bodies of others drawn out of the ruins. He confirmed the published statements of the inhabitants having availed themselves of fallen trees to avoid being engulfed in open fissures, and I afterwards heard that this singular mode of escape had been adopted in distant places, between which there had been no communication, and that even children threw themselves on the felled trunks. My iew acquaintance then took me to see several fissures still open, which had been caused by the unlulatory movement of the ground, some of them agged, others even and straight. I traced two of hem continuously for more than half a mile, and ound that a few were parallel; but, on the whole, hey varied greatly in direction, some being ten and thers forty-five degrees west of north. I might asily have mistaken them for artificial trenches, if ny companion had not known them within his ecollection to have been "as deep as wells." Sand nd black shale were strewed along their edges. They were most of them from two to four feet vide, and five or six feet deep; but the action of ains, frost, and occasional inundations, and above all he leaves of the forest blown into them every auumn in countless numbers, have done much to fill hem up.

Continuing my ride, I came to the house and farm f Mr. Love, who had long resided in this district, nd he took me to part of the forest, on the borders f what is called the "sunk country," where all the trees of a date prior to 1811, although standing erect nd entire, are dead and leafless. They are chiefly aks and walnuts, with trunks three or four feet in diameter, and many of them 200 years old. They are supposed to have been killed by the loosening of the roots during the repeated undulations which passed through the soil for three months in succession. The higher level plain, where these dead trees stand, terminates abruptly towards the Bayou St. John, and the sudden descent of eight or ten feet throughout an area four or five miles long, and fifty or sixty broad, was caused, my informant assured me, by the earthquake. At the lower level are seen cypresses and cotton-wood, and other trees which delight in wet ground, all newer than 1812. I was told that there are some places where the descent from the upper level to that of the sunk country is not less than twenty and even thirty feet. In part of this sunk ground I saw not only dead oaks and hickory still erect, but aged gum-trees also and cypresses (*Cupressus disticha*).

While I was riding with Mr. Love he stopped his horse, and asked me if I did not feel the shock of an earthquake. When my attention was called to it, I fancied I had perceived it, but was not sure. He said they were frequent, although he had not felt one for the last fortnight. It was now three years since they had been seriously alarmed by any movement. We looked at our watches, and when we returned to the farm he inquired of the family if anything had happened. They said they had felt a shock, and heard a sound like distant thunder, at twenty-five minutes past eleven o'clock, which agreed exactly with the time when my companion had felt the motion.

If the information I obtained from several quarters be correct, in regard to the country permanently submerged by the earthquake of 1811–12, the area must exceed in magnitude what was stated in former accounts. The "sunk country," I am told, extends along the course of the White Water and its tributaries for a distance of between seventy and eighty miles north and south, and thirty miles east and west. A trapper, who had been hunting on the Little River, told me, that large spaces there were obviously under water, owing to the great shake, because the dead trees were still standing. In the true hunter spirit, he regarded the awful catastrophe of 1811–12 as a blessing to the country, and expatiated with delight on the vast area turned into lake and marsh, and the active trade carried on ever since in the furs of wild animals. It had been the making of New Madrid, he affirmed, which would become a rival of St. Louis, and exported even now at least half as many peltries. There had been taken last year 50,000 racoon skins, and 25,000 musk-rats for making hats and caps; 12,000 mink for trimming dresses; 1000 bears and 1000 otters; 2500 wild cats, 40 panthers, and 100 wolves. Beavers there were none, or only five or six had been trapped. He had gone in his canoe, which carried his hut, his gun, and his baggage, over the whole sunk country, and described to me the villages or hummocks built in the swamps by the musk-rats, which he called "French settlements," a piece of impertinence in which the Anglo-Americans indulge towards the creoles of Louisiana. He told me that within the area of the sunk country in Arkansas, about eighty miles from New Madrid, is a space called Buffalo Island, containing about twenty-five square miles, where, two years ago, (1844,) a herd of buffaloes, 300 or 400 strong, was surprised, and six of them taken.

The sunk country is not confined to the region west of the Mississippi; for, on my way up the river, I learnt from Mr. Fletcher, a farmer, who had a wooding station in Tennessee, that several extensive forest tracts in that State were submerged during the shocks of 1811–12, and have ever since formed lakes and swamps, among which are those called Obion and Reelfoot. He had observed in several of these, that trees which had been killed, and had stood for a long time partially submerged, had in many places rotted down to the water's edge. In some swamps caused by the earthquake, they had all decayed to within a few inches of the base of the trunk. It is therefore evident, that should the turbid waters of the Mississippi overflow that region, and deposit their sediment on such stumps, they would present to the geologist a precise counterpart of the buried stools of trees with their roots before described as occurring at the bottom of the bluff at Port Hudson.* Mr. Fletcher also told me, that he knew several fissures in Tennessee, formed in 1811–12, where the ground on one side of the rent remained higher by two feet than that on the other side.

I was informed at New Madrid that the Indians, before the year 1811, had a tradition of a great earthquake which had previously devastated this same region. Yet there is so wide an area of forest without sink-holes, or any great inequalities of surface, and without dead trees like those above alluded to, that we cannot suppose any convulsion of equal magnitude to have occurred for many centuries previous to 1811.

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* Ante, pp. 177—180.

Having explored the margin of the Great Prairie, and seen the sunk country several miles west of New Madrid, I returned by a different path through the woods, often losing my way, till I fell into the main road for the last six miles, which was cut straight through the forest, and was at this season singularly monotonous and dreary. It was furrowed with long deep ruts, cut in black mud, and full of miry water. The sky was cloudy, and the plain as level as if it had never been disturbed by the slightest subterranean movement since it originated. The trees were, for the most part, leafless, and almost all of the same height, with no evergreens below them, and no grass; but, instead of it, a sombre brown covering of damp and dead oak leaves, strewed evenly over the ground. At one point I saw the rotting trunks of several fallen trees, and near them an old oak, on the boughs of which, near the base, a group of five turkey-buzzards were perched, in perfect character with the rest of the scene. Twilight was coming on, and the woods were silent; but, as I approached the river, the silence was agreeably broken by the varied and liquid notes of a mocking-bird, and, at the same time, one of the large woodpeckers, with its brilliant plumage, flew over my head, as if to remind me that at other seasons the solitude is cheered by the song and bright colours of birds, when the leaves of the trees unfold themselves, and the sun's heat would then be so intense, that a traveller would gladly retreat into the shades of the dense forest.

When I took back my horse to its owner in New Madrid, I received a pressing invitation to exchange our present homely quarters for her comfortable house. Some of the other principal merchants made us hospitable offers of the same kind, which were exceedingly tempting. We thought it right, however, to decline them all, as we might have hurt the feelings of our German host and his wife, who, in their anxiety to accommodate us, had purchased several additional household articles. Among these was a table-cloth, and, when I entered the house, I was amused at the occupations of my wife and her companion. The baker's lady had accepted the offer of her guest to hem the new table-cloth, in which task she was busily engaged; while the settler in the backwoods, having discovered that my wife had brought from New Orleans a worked collar of the latest Parisian fashion, had asked leave to copy it, and was intent on cutting out the shape, thus qualifying herself to outdo all the "fashionists" of the "sunk country."

A great spirit of equality was observable in the manners of the whites towards each other at New Madrid, yet with an absence of all vulgar familiarity. But what I saw and heard, convinced me that the condition of the negroes is least enviable in such out-of-the-way and half civilised districts, where there are many adventurers, and uneducated settlers, who have little control over their passions, and who, when they oppress their slaves, are not checked by public opinion, as in more advanced communities. New comers of a higher tone of sentiment are compelled sometimes to witness cruelties which fill them with indignation, heightened by the necessity of being silent, and keeping on good terms with persons of whose conduct they disapprove. To the passing stranger, they can enlarge on this source of annoyance, and send him away grieving that so late as the year 1821, Missouri should have been added to the Union as a Slave State, against the wishes of a respectable minority of its own inhabitants, and against the feeling of a majority of the more educated population of the North.

CHAP. XXXIV.

Alluvial Formations of the Mississippi, ancient and modern. — Delta defined. — Great Extent of Wooded Swamps. — Deposits of pure Vegetable Matter. — Floors of Blue Clay with Cypress Roots. — Analogy to ancient Coal-measures. — Supposed "Epoch of existing Continents." — Depth of Freshwater Strata in Deltas. — Time required to bring down the Mud of the Mississippi. — New Experiments and Observations required. — Great Age of buried and living Cypress-trees. — Older and newer Parts of Alluvial Plain. — Upraised Terraces of Natchez, &c., and the Ohio, the Monuments of an older Alluvial Formation. — Grand Oscillation of Level. — The ancient Valleys inhabited by Quadrupeds now extinct. — Land-shells not changed. — Probable Rate of Subsidence and Upheaval. — Relative Age of the ancient Alluvium of the Mississippi, and the Northern Drift.

BEFORE leaving the valley of the Mississippi, I shall take this opportunity to offer some general remarks on the modern delta and alluvial plain of the great river, and on those freshwater deposits before described in the bluffs of Port Hudson, Natchez, Vicksburg, and Memphis, which I regard as the monuments of a more ancient alluvial formation, one of high antiquity, yet formed when the physical geography of the country already bore a great resemblance to that now existing, and when, moreover, the land and waters were inhabited by the same species of terrestrial, fluviatile, and lacustrine mollusca, which now inhabit this region, although the land quadrupeds were almost entirely different.

The delta of the Mississippi may be defined as that part of the great alluvian slope, which lies below, or to the south of the branching off of the highest arm, or that called the Atchafalaya. Above this point, which is the head of the delta, the Mississippi receives water from its various tributaries; below, it gives out again, through numerous arms or channels, the waters which it conveys to the sea. The delta, so defined, is about 14,000 square miles in area, and elevated from a few inches to ten feet above the level of the sea. The greater part of it protrudes into the Gulf of Mexico, beyond the general coast line. The level plain to the North, as far as Cape Girardeau, in Missouri, above the junction of the Ohio, is of the same character, including, according to Mr. Forshey, an area of about 16,000 square miles, and is, therefore, larger than the delta. It is very variable in width from east to west, being near its northern extremity, or at the mouth of the Ohio, 50 miles wide, at Memphis 30, at the mouth of the White River 80, and contracting again further south, as at Grand Gulf, to 33 miles. The delta and alluvial plain rise by so gradual a slope from the sea as to attain at the junction of the Ohio (a distance by the river of 1,100 miles) an elevation of only 320 feet above the Gulf of Mexico.

First, in regard to the whole alluvial slope, whether above or below the present head of the delta, it will appear, from what has been already said, that sand is thrown down near the borders of the main river and its tributaries, and fine mud at more distant points. The larger portion, however, of the whole area consists of swamps, supporting a luxuriant growth of timber, interspersed with lakes, most of which are deserted river bends. These lakes are slowly filling up, and every swamp is gradually becoming shallower, the substances accumulated in them being, for the most part, of vegetable origin, unmixed with earthy matter. It is only on their exterior margins (except after a sudden subsidence, during an earthquake like that of 1811–12,) that the waters of the Mississippi throw down sediment in the interior of any large swamp or lake, for the reeds, canes, and brushwood, through which the waters must first pass, cause them to flow slowly, and to part with all the matter previously held in mechanical suspension. Long before they reach the central parts of a morass or lake, they are well filtered, although still deeply stained by vegetable matter in a state of decomposition.

Over a large portion of the submerged areas of the great plain, trees are seen growing everywhere in the water. Into the deeper water, where no forest can grow, the trunks of trees are floated, and many of these sink, when water-logged, to the bottom, which is also raised by an annual deposit of leaves, and of peaty matter derived from decaying plants, of which there is an exuberant growth round the borders of every swamp. That the admixture of inorganic matter is very small, has been shown by the observations of Messrs. Dickeson and Brown, who state, "that when the woods are burning, after an unusually dry season, pits are found burnt into the ground as far as the fire can descend without coming in contact with water, and scarcely any residuum or earthy matter is left."* They also state that at the bottom of all the cypress swamps or brakes, there is found a peculiar layer of tenacious blue clay, which forms the foundation, or floor, on which the vegetable matter accumulates. We may conclude, therefore, that as the roots of the cypress penetrate far beneath the soil, and project horizontally far and wide, those of one tree interlacing with another, such root-bearing beds of argillaceous loam must be very analogous to what are called fire-clays, so well known to the geologist as occurring underneath almost every seam of coal in the ancient carboniferous rocks.†

Other points of analogy might also be indicated between the deposits, whether of organic or inorganic matter, now accumulating in the valley-plain and delta of the Mississippi, and those of the ancient carboniferous rocks. When, for example, depressions are suddenly caused, as in the "sunk country" before described, certain wooded areas being submerged, the lower parts of the erect trees become enveloped with sand and mud, the upper portions rotting away, as must have happened in the case of the celebrated fossil forest of Dixon-fold, in Lancashire, belonging to the ancient coal-measures.* In the modern alluvial plain, also, river-sand will be often thrown down, as the Mississippi shifts its course over spaces on which pure vegetable matter had been previously accumulating for hundreds or thousands of years, just as we find sandstone sometimes resting immediately upon the old coal-seams; and, if there be a long succession of downward movements, the thickness of strata, all formed in shallow water or in swamps, may be indefinitely great. Should the hilly country, moreover, be distant, pebbles will no more be seen in the modern sand strewed over the buried trees and layers of vegetable matter, than they usually are in the grits associated with the coal of ancient date. The phenomena, also, of the New Madrid earthquake, may help us to explain the vast geographical area over which, in the course of ages, dense fluviatile and lacustrine strata, with intercalated beds of vegetable origin, may be made to extend without any inroads of the sea. For the inland parts of any hydrographical basin may be augmented indefinitely in length and breadth, while the seaward portions continue unaltered, as the delta around New Orleans, and the low lands bordering the Gulf of Mexico, preserved their level unchanged, while parts of Missouri and Tennessee were lowered.

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* Silliman's Journal, Second Series, vol. v. p. 17. January, 1848.

† In my former "Travels," I have alluded to the fire-stones with Stigmaria (now acknowledged to be the root of Sigillaria), underlying the American coal-seams, as they do those of South Wales, 3000 miles distant.—"Travels in North America," vol. i. p. 62.

By duly appreciating the permanent geographical revolutions which would result from a succession of such earthquakes as that of 1811–12, in the territory of New Madrid, we shall be prevented from embracing the theory implied in the language of those who talk of "the epoch of existing continents." In treating of deltas, they are in the habit of assuming that the present mass of alluvial matter which has been thrown into the sea at the mouths of great rivers, began to be deposited in all the great hydrographical basins of the world at one and the same fixed period — namely, when the formation of the existing continents was completed; as if the relative levels of land and sea had, during that time, remained stationary, or had been affected to so inconsiderable an amount, as to be unimportant in their influence on the physical geography of each region, in comparison with the changes wrought by the rivers, in converting sea into land. But what we already know of the deltas of the Po, Indus, Ganges, and other rivers, leads to a very different conclusion. The boring of an artesian well at Calcutta was carried to the depth of 481 feet, the greater part of the section being below the level of the sea, and yet all the beds pierced through were of freshwater origin, without any intermixture of marine remains. At different depths, even as far down as 380 feet, lacustrine shells, and a stratum of decayed wood, with vegetable soil, which appears to have supported trees, was met with.* These appearances may readily be accounted for, by assuming that there was a gradual subsidence of the ground for ages, which was as constantly raised by the accession of fluviatile sediment, so as to prevent any incursion of the sea. Occasionally there were pauses in the downward movement, when trees grew on the soil, and vegetable matter of some thickness had time to accumulate.

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* Proceedings of Geol. Society, 1839, p. 139.

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* See "Principles of Geology," Seventh Edition, 1847, p. 266.

Recent observations, by Morlot and others, have demonstrated that, since the time of the Romans, there has been a general subsidence of the coast at the head of the Adriatic, to the amount of five feet, which has not prevented the delta of the Po and other rivers from advancing on the sea, although it must have checked their progress. Of the much greater movements of elevation and depression which have taken place in the delta of the Indus, especially those wrought in the year 1819, I have elsewhere given an account.* It would, therefore, be perfectly consistent with analogy to find, in the neighbourhood of New Orleans, ancient swamp formations, with the roots and stumps of erect trees, unmixed with marine remains, far below the level of the sea, as is the fact, if I can rely on the information given me in 1846.†

Finding it impossible to calculate the age of the delta, from the observed rate of the advance of the land on the Gulf in each century, I endeavoured to approximate, by a different method, to a minimum of the time required for bringing down from the upper country that large quantity of earthy matter which is now deposited within the area of the delta.

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* Principles, Seventh Edition, p. 437.

† See ante, p. 137.

Dr. Riddell communicated to me, at New Orleans, the result of a series of experiments which he had made, to ascertain the proportion of sediment contained in the waters of the Mississippi. He concluded that the mean annual amount of solid matter was to the water as $\frac{1}{1245}$ in weight, or about $\frac{1}{3000}$ in volume.* Since that period, he has made another series of experiments, and his tables show that the quantity of mud held in suspension, increases regularly with the increased height and velocity of the stream. On the whole, comparing the flood season with that of clearest water, his experiments, continued down to 1849, give an average annual quantity of solid matter somewhat less than his first estimate, but not varying materially from it. From these observations, and those of Dr. Carpenter and Mr. Forshey (an eminent engineer, to whom I have before alluded), on the average width, depth, and velocity of the Mississippi, the mean annual discharge of water and sediment was deduced. I then assumed 528 feet, or the tenth of a mile, as the probable thickness of the deposit of mud and sand in the delta; founding my conjecture chiefly on the depth of the Gulf of Mexico between the southern point of Florida and the Balize, which equals, on an average, 100 fathoms, and partly on some borings, 600 feet deep, in the delta near Lake Pontchartrain, north of New Orleans, in which the bottom of the alluvial matter is said not to have been reached. The area of the delta being about 13,600 square statute miles, and the quantity of solid matter annually brought down by the river 3,702,758,400 cubic feet, it must have taken 67,000 years for the formation of the whole; and if the alluvial matter of the plain above be 264 feet deep, or half that of the delta, it must have required 33,500 more years for its accumulation, even if its area be estimated as only equal to that of the delta, whereas it is in fact larger.

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* The calculations here given, were communicated to the British Association in a Lecture which I delivered at Southampton, in September, 1846. See "Athenæum Journal," Sept. 26. 1846, and "Report of British Association," 1846, p. 117.

From information since received, I think it not improbable that the quantity of water may have been underrated in this estimate*; and, if so, a larger amount of sediment would have been brought down from the interior in a given time, and consequently a deduction would have to be made from the number of centuries above stated on that account. But, on the other hand, if it could be shown, by more accurate experiments and calculations, that the quantity of water in the above computation was greatly deficient, say even one-third less than the real quantity, I do not imagine that any exaggeration has been made in the time supposed to have elapsed since the rivers began to transport their earthy ingredients to the alluvial plains of Louisiana. The delta is, after all, a mere fragmentary portion of a larger body of mud, the finer particles of which never settle down near the mouths of the Mississippi, but are carried far out into the Gulf, and there dispersed.

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* I allude chiefly to the observations and experiments, on the velocity of the Mississippi at various depths, made by Mr. W. H. Sidell, during a Government survey, communicated to me through the kindness of Mr. Ruggles, of New York, which, if correct, would lead to the inference that the average number of cubic feet of water discharged into the Gulf per second is considerably greater than Mr. Forshey and Dr. Carpenter deduced from their observations on the velocity of the stream at different depths. If, as I understand, there exist documents in the hydrographer's office at Washington, which would afford more ample data for such calculations, the Government would confer a boon on the scientific world by publishing them without delay. Such experiments as Mr. Sidell's, which give the velocity at various depths and at different distances from the banks, are the more needed, because it seems doubtful whether any correct mathematical formulæ have as yet been furnished for calculating the mean rate at which so deep a river as the Mississippi flows, from observations made simply on its superficial velocity. I placed all the data given me by Messrs. Riddell, Forshey, and Carpenter, in the hands of

my friend, Mr. George Rennie, F.R.S., to whom we are indebted for many valuable papers on the application of the science of hydraulics to rivers (see Report of British Association, vol. iii. p. 415. 1834), and, after examining them, he came to conclusions which did not vary materially from those which I had previously announced.

Feb. 6. 1850. Since the first edition of this work appeared, Messrs. Andrew Brown and M. W. Dickeson, in their report to the American Association for Advancement of Science, Philadelphia, 1848 (published in 1849), give an estimate of the mean annual discharge of water by the Mississippi as nearly one-third more than Dr. Riddell's, and the solid matter held in suspension as 1 to 528 instead of 1 to 3000, as given by Riddell. Knowing the great care taken by Dr. R. to procure test-water, holding an average portion of sediment in suspension, I am disposed to believe that the waters selected by the two other observers must have been in a turbid condition far above the annual mean; but so great a discrepancy shows the need of a new series of experiments.

The description which I have given of the great distance to which the yellow and lighter streams of freshwater are seen extending, from the various mouths, in the flood season, into the Gulf; and still more, the destruction of the banks and bars of mud and sand caused by the tide scouring out the channels when the river is low*, and the strength of the marine current, running ten miles an hour, and the stories of anchors and heavy ballast cast up by the breakers high and dry on the shifting shoals near the extremity of the delta, make me doubt whether the larger part of that impalpable mud, which constitutes the bulk of the solid matter carried into the sea by the Mississippi, is not lost altogether, so far as the progress of the delta is concerned. So impalpable is the sediment, and so slowly does it sink, that a glass of water, taken from the Mississippi, may remain motionless for three weeks, and yet all the earthy matter will not have reached the bottom. If particles so minute are carried by the current, setting for a great portion of the year from west to east, across the mouth of the river, into the Gulf Stream, and so into the Atlantic, they might easily travel to the banks of Newfoundland before sinking to the bottom; and some of them, which left the head waters of the Missouri in the 49th degree of north latitude, may, after having gone southwards to the Gulf, and then northwards to the Great Banks, have found no resting-place before they had wandered for a distance as far as from the pole to the equator, and returned to the very latitude from which they set out. Were it not for the peculiar manner in which the Mississippi forms long bars of sand, which frequently unite with some part of the coast, so as to dam out the sea and form lagoons, the deposition of sediment in the delta would be much less considerable. A lagoon, like Lake Pontchartrain, once formed, becomes a receptacle of the finest mud, poured into it by the great river during floods, and the space thus parted off from the Gulf by bars of sand, is protected from the action of the breakers and marine currents.

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* See ante, p. 154.

When I inquired what might be the depth of fluviatile mud in the suburbs of New Orleans, I was told that, in making a railroad near Lake Pontchartrain, piles were driven down sixty feet into the soft mud or slush, and when a boring was made there, 600 feet deep, beds of gnathodon were found, but no marine shells.

The depth of the alluvium may vary in different parts of the great sloping plain; for certain areas, such as the "sunk country," for example, west of New Madrid, may have been repeatedly depressed, and have been always brought up again to the same superficial level, by the deposition of river mud, or the growth of vegetable matter.

The age of stumps and erect trunks of the deciduous cypress, whether living or buried, retaining their natural position, at points near the present termination of the delta, ought to be carefully examined, as they might afford evidence of the minimum of time which can be allowed for the gain of land on the sea. Some single trunks in Louisiana are said to contain from 800 to 2000 rings of annual growth, and Dr. M. W. Dickeson and Mr. A. Brown state, that the cypress brakes or basins, which fill up gradually, give place at length to other timber; but before this happens, the buried cypress stumps often extend through a deposit of vegetable and sedimentary matter twenty-five feet thick. "Sections of such filled-up cypress basins, exposed by the changes in the position of the river, exhibit undisturbed, perfect, and erect stumps, in a series of every elevation with respect to each other, extending from high-water mark down to at least twenty-five feet below, measuring out a time when not less than ten fully-matured cypress growths must have succeeded each other, the average of whose age could not have been less than 400 years, thus making an aggregate of 4000 years since the first cypress tree vegetated in the basin.* There are also instances where prostrate trunks, of huge dimensions, are found imbedded in the clay, immediately over which are erect stumps of trees, numbering no less than 800 concentric layers."

Michaud, in his famous work on the forest trees of North America, mentions that stems of this deciduous cypress (*Taxodium distichum*) are met with in Florida, and in Southern Louisiana, forty feet in circumference above the enlarged base, which is three or four times that size; but such individuals dwindle to nothing before the gigantic trunk near Santa Maria del Tule, in the province of Oaxaca, in Mexico, which was first mentioned by Exter, who found its circumference to be 117·10 French feet. Zuccarini has lately removed the doubts of De Candolle respecting this measurement, which was taken above the dilated base, for that was no less than 200 feet in circumference. In this stem there would be 5352 rings of annual growth, if one line a year was taken as the average growth, the deposit of wood becoming always much smaller in trees of great age; but Zuccarini, in his estimate, thinks it may be safer to assume 1·6 line as the average, which would even then give the age of 3512 years for this single tree.

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* Silliman's Journal, Second Series, vol. v. p. 17. January, 1848.

The great number of crescent-shaped lakes to the westward of the Mississippi, which formerly constituted bends in its ancient channel, are also monuments of the antiquity of the great plain over which the river has been wandering. Darby, the geographer, observed that, in the steep banks of the Atchafalaya, there are alternations of the blueish clay of the Mississippi and of the red ochreous earth peculiar to Red River, proving that the waters of these two streams once occupied alternately considerable tracts below their present point of union.* Since their junction (an event, the date of which is unknown), the waters and sediment of the Red River and Mississippi have been thoroughly mixed up together, before any deposition of their mud takes place in the lower country. It is evident, therefore, that, when we are enabled, by geological observations such as those of Darby, to distinguish the older from the newer portions, even of the modern alluvial plain, we may obtain more aid in our chronological computations founded on rings of growth in buried trees; for we may then add the years deduced from stumps buried in the modern parts of the delta, to those proved by the structure of trees included in mud of earlier date.

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* Darby's Louisiana, p. 103.

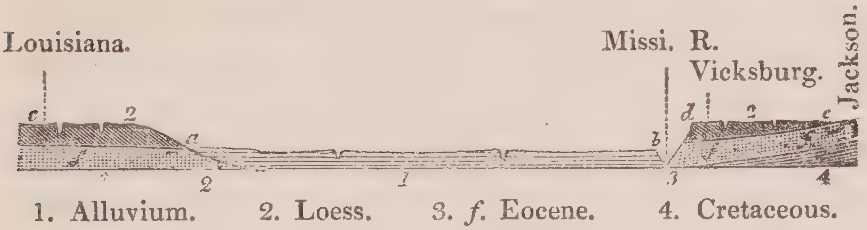
After considering the age and origin of the modern deposits of the Mississippi and its tributaries, we have still to carry back our thoughts to the era of the freshwater strata seen in the bluffs which bound the great valley. These, in their southern termination, have evidently formed an ancient coast-line, beyond which the modern delta has been pushed forward into the sea. Let *a*, *b* (fig. 10.) represent the alluvial plain of the Mississippi, bounded on its eastern side at Vicksburg, as before described, by the bluffs *d*, at the foot of which are seen the Eocene strata, *f*, the upper part of the bluff being composed of shelly loam, or loess, of freshwater origin, *d*, *e* (No. 2.).

At Memphis, Port Hudson, and many other places, loam of the same age as No. 2., rising from 50 to 200 feet above the level of the sea, constitutes the entire bluffs, forming a table-land like that represented at *d*, *e*. Similar deposits, *a*, *c* (fig. 10.), recur in Louisiana, on the western side of the great valley; but they are not, I am informed, denuded so as to present a steep bluff at *a*. They rest equally on Eocene strata, *f* (No. 3.).

From what has been said of the species of shells contained in the loam, *d*, *e*, at Natchez, and in other localities, from the remains also of associated terrestrial animals, and from the buried trees of Port Hudson, we have inferred that these deposits (No. 2.), are the monuments of an ancient alluvial plain, of an age long anterior to that through which the Mississippi now flows, which was inhabited by land and freshwater mollusca agreeing with those now existing, and by quadrupeds now for the most part extinct.

Fig. 10.

VALLEY OF THE MISSISSIPPI.



In my former "Travels in North America," I described some ancient terraces of gravel, sand, and loam, occurring everywhere in the valley of the Ohio, and gave a section of them as they are seen at Cincinnati.* I pointed out that the included fossil shells demonstrate the fluviatile and modern origin of the deposits, and suggested that their present position could only be explained by supposing, first, a gradual sinking down of the land after the original excavation of the valley, during which period the gravel and sand were thrown down, and then an upheaval of the same valley, when the river cut deep channels through the freshwater beds.† Certain swamp formations observable in the valleys of small tributaries of the Ohio, such as those of Big Bone Lick, in

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* Travels in North America, fig. 9., vol. ii. p. 59. chap. xvii.

† The second terrace (*c*, fig. 9. ibid.) at Cincinnati, may imply a second oscillation.

Kentucky, and Mill Creek, near Cincinnati, are of geological celebrity, in consequence of the great number of skeletons of extinct mammalia, such as the megalonyx, mastodon, elephant, and others, which seem to have lived, and have been mired in ancient morasses, before the land began to sink; for the great mass of fluviatile loam and gravel forming the terraces, has been superimposed on the black bog earth containing such bones. The teeth, however, and bones of similar extinct quadrupeds, especially the mastodon, are occasionally met with scattered through the incumbent gravel and loam, so that the same assemblage of quadrupeds continued to inhabit the valleys while the first change of level or the subsidence was going on. By simply extending to the valley of the Mississippi, the theory before applied to that of the Ohio, we may, as already stated at p. 183. in reference to the Port Hudson bluffs, account for the geological appearances seen in the larger and more southern area.

It has been long ascertained that in Norway and Sweden a gradual rise of the land above the sea has been going on for many centuries, producing an apparent fall in the waters of the adjoining ocean. The rate of elevation increases as we proceed northwards from Gothenburg to the North Cape, the two extremities of this line being distant more than a thousand geographical miles from each other, and we know not how much farther north or south the motion may be prolonged under water. The rise of the land, which is more than five feet in a hundred years at the North Cape, gradually diminishes to a few inches in a century in the neighbourhood of Stockholm, to the south of which the upward movement ceases; and in Scania, the southernmost part of Sweden, appears to give place to a slight movement in an opposite or downward direction.*

We also know that part of the west coast of Greenland, extending about 600 miles north and south, has been subsiding for three or four centuries between latitudes 60° and 69° N.† But whether, in this instance, the rate of depression varies in different parts of the sinking area, has not yet been determined. In speculating, however, on the manner in which the valleys of the Mississippi and its tributaries may have been affected by subterranean movements, we are at least authorised by analogy to assume that the downward movement may have been greater in the more inland part of the continent, just as we have seen in 1811–12, that the "sunk country" west of New Madrid subsided, while the level of the delta at New Orleans underwent no sensible change. If, then, the vertical movement in the interior, in and near the valley of the Ohio, for example, were greater than near the Gulf, as if, in the former case, it were two and a half feet in a century, and near the sea only half that amount, it would follow that the general fall of the rivers would be lessened. They would deposit all their heavier, and some even of their finer sediment, in their channels, instead of having power to carry it to the sea. They would fill up their beds, and often overflow the adjoining plains, raising their level by repeated layers of fluviatile matter or silt, frequently containing the shells of land and amphibious mollusks.

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* Principles of Geology, Seventh Ed. p. 506.

† See "Principles," ibid.

If, even now, the Mississippi, when flooded, dams up the mouths of its great tributaries, and transforms them for months into temporary lakes, it must have produced the same effect to a far greater extent if at any time the general fall of the country towards the sea was less rapid.

In narrow valleys bounded by ancient rocks 500 or 600 feet high, such as that of the Ohio, the alluvial formation could never acquire great breadth. Its thickness would depend entirely on the length of time throughout which the subsidence was prolonged. But nearer the sea, where the continent falls with a gentle slope towards the Gulf, the encroachment of the freshwater deposits (No. 2. fig. 11. p. 262.), of the great river on the tertiary strata (No. 3.), constituting the original bluffs on its eastern and western boundaries, might be very great.

If we then suppose the downward movement to cease, and to be at length converted into an ascending one, the rate of upheaval being greatest in the more inland country, the fall of every river, and consequently its velocity, would begin immediately to augment. Their power of carrying earthy matter seaward, and of scouring out and deepening their channels, would be greater and greater, till at length, after a lapse of many thousand years, each of them would have eroded a deep channel or valley through the fluviatile formation previously accumulated. The surface of what was once the river-plain at the period of greatest depression, would remain fringing the valley sides as a terrace, apparently flat, but in reality sloping down with the general inclination of the valley. Everywhere this terrace would present cliffs of gravel and sand facing the river.

After these changes, the fundamental strata (Nos. 3, 4, 5. fig. 11. p. 262.) might be restored nearly to their ancient positions; the freshwater beds (No. 2.) having been raised, and having suffered great denudation.

It is not improbable that the same series of movements gave rise to the accumulation and present position of marine strata of comparatively modern date, forming the lower terrace near Darien in Georgia* which is indicated at 2*, in the annexed section (fig. 11.). The reader will remember that the remains of the megatherium, mastodon, elephant, Harlanus, equus, and other extinct species of land quadrupeds, are there associated with marine shells, of species agreeing with those now inhabiting the Atlantic.

On the other hand, there are proofs in Texas of the prevalence of the same succession of subterranean movements far to the south-west, along the country bordering the Gulf of Mexico; for on the Brazos river there are beds of loam, or loess, examined by Dr. Dickeson, and, when at New Orleans, I saw the bones of extinct quadrupeds brought from that deposit. Among them was the jaw-bone of a tapir,

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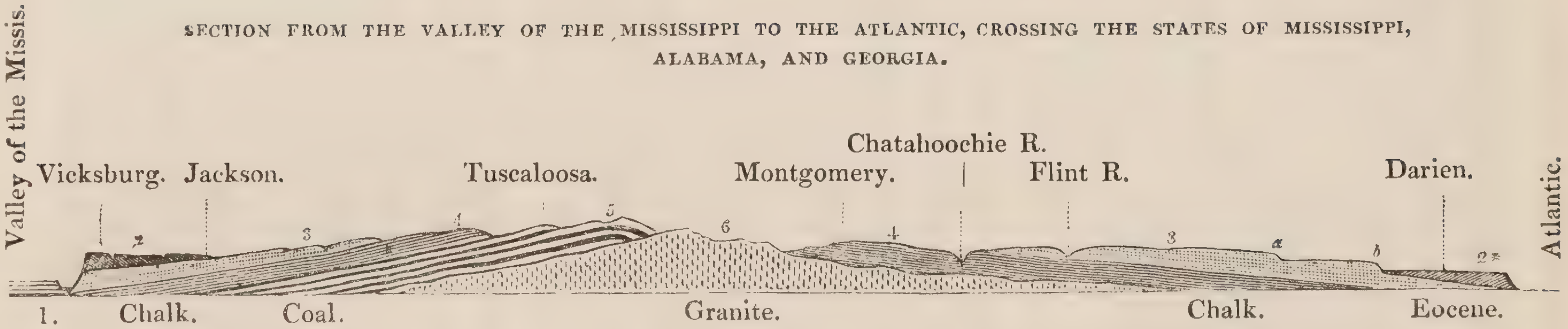
* See ante, vol. i. p. 346.

Fig. 11.

SECTION FROM THE VALLEY OF THE MISSISSIPPI TO THE ATLANTIC, CROSSING THE STATES OF MISSISSIPPI, ALABAMA, AND GEORGIA.



Length of Section 550 miles.

1. Modern alluvium of the Mississippi.
2. Ancient fluviatile deposit with recent shells and bones of extinct mammalia ; loess.
2*. Marine and freshwater deposit with recent sea shells and bones of extinct land animals.
3. Eocene, or lower tertiary with Zeuglodon. *a. b.* Terraces. Vol. i. p. 345.
4. Cretaceous formation ; gravel, sand, and argillaceous limestone.
5. Coal-measures of Alabama (Palæozoic). See vol. ii. p. 80.
6. Granite.

apparently identical with the South American species; remains of the mastodon, elephant, ox, and other mammalia, much resembling, on the whole, those found at Natchez and on the Ohio.

As to the seaward extremity of the ancient delta, the effect of the gradual depression of land above assumed would be to cause its mud and sand to increase in thickness, instead of augmenting in area. When at length the movement was reversed, and the freshwater deposits began to rise, the action of the sea would undermine them, and, aided by the river and tides, sweep much of them away, and perhaps shape out a bay. But the swamp-mud, with innumerable interlaced roots of cypress and other trees, might offer considerable resistance; and, after a time, the river charged with sediment would throw down bars, and form a breakwater, to protect the newly upraised deposits from annihilation.

In regard to the time consumed in accomplishing the great oscillation of level which first depressed so large an area to the depth of 200 feet or more, and then restored it to its former position, it is impossible, in the present state of science, to form more than a conjecture as to the probable mean rate of movement. To suppose an average sinking and upheaval of two and a half feet in a century, might be sufficient, or would, perhaps, be too great, judging from the mean rate of change in Scandinavia, Greenland, the north of the Adriatic, and other regions. Even such an oscillation, if simultaneously continuous over the whole area, first in one direction, and then in another, and without any interruptions or minor oscillations, would require sixteen thousand years for its accomplishment. But the section at Cincinnati seems to imply two oscillations, and there would probably be pauses, and a stationary period, when the downward movement ceased, and was not yet changed into an upward one. Nor ought we to imagine that the whole space was always in motion at once.

When we have at length done our best to trace back the history of the more modern and more ancient alluvial formations of the Mississippi, the question still remains, what may be their age relatively to the great body of the drift containing erratic blocks in the northern latitudes of this same continent. The terraces of gravel and loam bordering the Ohio, and those on a larger scale, but of the same age, which constitute many of the eastern bluffs of the Mississippi, are evidently features of subordinate importance in the physical configuration of the continent. But to explain the origin of the northern drift of the Canadian lake district, and of the St. Lawrence. as I have endeavoured to show in my former "Travels," requires a reference to such changes as would imply the submergence of a great part of the continent drained by the head waters of the Mississippi, Missouri, and their northern tributaries.* For this and other reasons, into which I cannot now enter, I presume that the great mass of the most elevated drift in the north, and the glacial grooving and polishing of the rocks, although they belong to a very modern era in the earth's history, were nevertheless anterior in date to the loam of Natchez and Vicksburg.

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* See vol. i. chap. ii. p. 47. and vol. ii. chap. xix. p. 99.

There exist in Canada, in the Niagara district, in New York, and other States north of the Ohio, lacustrine and swamp deposits of marl and bog-earth, including the bones of extinct quadrupeds, such as the mastodon, elephant, castoroides, and others, associated with land and freshwater shells of recent species, which are decidedly post-glacial, and often found in hollows in the drift. These may be of contemporaneous date with the loam of Port Hudson and Natchez.

The northern drift, however, is by no means all of the same age; and as the period of glaciers and icebergs freighted with erratics is still going on, and has now a wide range in the temperate parts of the Atlantic, bordering the eastern shores of North America, so must we naturally suppose that certain parts of the drift, especially those found at lower levels, and near the sea, may not be more ancient than the loam of the western bluffs of the Mississippi.

CHAP. XXXV.

Departure from New Madrid.—Night-watch for Steamers.—Scenery of the Ohio River.—Mount Vernon, Ornithology.—No Undergrowth in Woods.—Spring Flowers.—Visit to Dr. Dale Owen, New Harmony.—Fossil Forest of erect Trees in Coal-measures.—Movers migrating Westward.—Voyage to Louisville.—Professional Zeal of one of "the Pork Aristocracy."—Fossil Coral-reef at the Falls of the Ohio, Louisville.—Fossil Zoophytes as perfect as recent Stone-corals.

March 27. 1846.—WE took up our quarters in the wharf-boat at New Madrid in readiness to sail by the first steamer bound for the Ohio; for I wished to visit New Harmony in Indiana, and there was some risk of being detained several days. The first steamer we hailed, was bound for St. Louis, the next for the Cumberland river, in Tennessee, and a third, which might have taken us to Mount Vernon, in Indiana, where I meant to disembark, was unwilling to lose time by stopping, the captain shouting out that she was full of passengers, and heavily laden.

Before retiring to rest, I engaged with the keeper of the boat that he should appoint a good night-watch, and an hour after dark, I was awakened by the loud puffing and splashing of a steamer, evidently close at hand. Going on deck, I found the faithless black sentinel fast asleep. It was already too late to hail the vessel, but we made out that she was the Nimrod, and I afterwards learnt, that in the course of her voyage she was snagged, both her chimneys thrown down, and her boiler pierced, so that we had a narrow escape. I now gave the keeper of the wharf-boat to understand that the whole town of New Madrid should be informed next day in what manner their night-watches were kept, which piqued him, and he then lighted a large fire on the bank; but having no longer any faith in the sentinel, I could not sleep, so I determined to keep a look-out myself. Fortunately another steamer soon appeared; and, almost before she was fairly alongside, a party of active negroes leapt upon our deck, each snatching up an article of our luggage, while the clerk ushered us over the plank into a brilliantly lighted saloon. The change of scene to travellers who had been roughing it for several days under a humble roof, talking with trappers about the watery wilderness of the "sunk country," and who had just stepped out of a dark half-furnished wharf-boat, was more like the fiction of a fairy-tale, than a real incident in an ordinary journey. Some musicians were playing at one end of the room, which was 150 feet long, and a gay young party from New Orleans were dancing a quadrille. At the other end we were delighted to see a table covered with newspapers, for we were nearly a week in arrear of news, and their columns were filled with the recent debates of the English House of Commons. There were also many articles reprinted from the best European periodicals, quarterly and monthly, besides those published in New England and New York. Nor were any of the advantages afforded by this floating palace more like an eastern tale of enchantment, than the thought, as we went to our berths, that before we rose next morning to breakfast we should be transported more than a hundred miles on our route northwards against the current of a mighty river.

March 29. — Passed Cairo in the night, and next morning were at Smithland on the Ohio, at the mouth of the Cumberland river, having Kentucky on our right hand, and Illinois on the left. Limestone cliffs, bounding the valley, were a welcome sight, after the eye had been dwelling for so many weeks on flat and level regions. Although we had not yet ascended the river to a height of much more than 200 feet above the level of the sea, the climate had changed, and we were told that snow had fallen the day before. We observed that the red-bud, or Judas-tree, was not yet in flower.

On reaching the mouth of the Wabash river, which divides Illinois from Indiana, I learnt that when the ice breaks up there in the spring, it is often packed into such masses that, before melting, they float down with gravel frozen on to them as far as New Madrid. This fact may explain the coarseness of the materials observable in the shoals of the Mississippi, at low water, near Natchez, and still farther down; and may perhaps throw light on some large boulders, of a former period, in the ancient gravel below the shelly loam of Natchez.

At Mount Vernon we landed, and I collected there many fossil shells, of freshwater and land species, from a terrace of yellow loam, elevated many yards above high-water mark, on the Ohio. Returning from my excursion, I fell in with a naturalist of the place, armed with a rifle, and carrying some wild birds which he had shot. He was a shoemaker by trade, and had a collection of more than 150 well-stuffed birds from the neighbourhood. He told me that the notes I heard here in the woods were chiefly those of the red-bird, but that some of the most musical were the song of a brown thrush, called, in Indiana, the mocking bird, but differing from the real musician of that name, which, though abounding at New Madrid, does not range so far north as the Ohio. Conversing with him, I learnt that the loud tapping of the large red-headed woodpecker, so common a sound in the American forests, is not produced, as I had imagined, by the action of the beak perforating the bark or wood, but is merely a succession of sharp blows on the trunk of the tree, after which the bird is seen to listen attentively, to know if there are any insects within. Should they stir in their alarm, and betray the fact of their being "at home," the woodpecker begins immediately to excavate a hole in the rotten timber.

I had promised to pay a visit to Dr. David Dale Owen, the State geologist of Indiana, and hired a carriage which conveyed us to New Harmony, situated on the Wabash river sixty miles above its junction with the Ohio. On our way across the country, we went through a continuous forest, consisting chiefly of oak, beech, and poplar, without any undergrowth, and in this respect differing remarkably from the wooded valleys and hills of the Alleghanies, and the region eastward of those mountains, as well as all parts of New England. Here there were no kalmias or azaleas, or sweet fern, or candleberry, or other evergreens. The green carpet beneath the trees was made up largely of mosses, and among them was that beautiful European species of feather-moss, *Hypnum proliferum,* in great plenty. The trunks of many trees were spotted by a jet-black fungus resembling a lichen. Below the branches we were pleased to gather several spring flowers, the white anemone, the blood root (*Sanguinaria canadensis*), the dog-tooth violet (*Erythronium americanum*), and the spring-beauty (*Claytonia virginica*).

Though a large proportion of the mosses and other cryptogamia are identical with those of Europe, we saw no flower which was not peculiar to America. Many European plants, however, are making their way here, such as the wild camomile, and the thorn-apple (*Datura Stramonium*); and it is a curious fact, which I afterwards learnt from Dr. Dale Owen, that when such foreigners are first naturalised they overrun the country with amazing rapidity, and are quite a nuisance. But they soon grow scarce, and after eight or ten years can hardly be met with.

We spent several days very agreeably at New Harmony, where we were most hospitably welcomed by Dr. and Mrs. Dale Owen. The town is pleasantly situated in a valley watered by the Wabash, which here divides the States of Indiana and Illinois. Some large buildings, in the German style of architecture, stand conspicuous, and were erected by Rapp; but the communities founded by him, and afterwards by Robert Owen of Lanark, have disappeared, the principal edifice being now appropriated as a public museum, in which I found a good collection of geological specimens, both fossils and minerals, made during the State survey, and was glad to learn that the Legislature, with a view of encouraging science, has exempted this building from taxes. Lectures on chemistry and geology are given here in the winter. Many families of superior intelligence, English, Swiss, and German, have settled in the place, and there is a marked simplicity in their manner of living which reminded us of Germany. They are very sociable, and there were many private parties where there was music and dancing, and a public assembly once a week, to one of which we went, where quadrilles and waltzes were danced, the band consisting of amateur musicians.

Say, the eminent zoologist, who died at the age of forty-five, formerly resided at New Harmony; and recently Prince Maximilian, of Neuwied, and the naturalists who accompanied him, passed a winter here. We found also, among the residents, a brother of Mr. Maclure, the geologist, who placed his excellent library and carriage at our disposal. He lends his books freely amongst the citizens, and they are much read. We were glad to hear many recent publications, some even of the most expensively illustrated works, discussed and criticised in society here. We were also charmed to meet with many children happy and merry, yet perfectly obedient; and once more to see what, after the experience of the last two or three months, struck us as a singular phenomenon in the New World — *a shy child!*

I made some geological excursions with Dr. Owen and his friend Mr. Bolton, to see the "carboniferous rocks," of which this region is constituted, and the shelly loam, like that of Natchez, which has evidently once filled up to a considerable height the valley of the Wabash, and through which the running waters have re-excavated the present valley.

There is no church or place of public worship in New Harmony; a peculiarity which we never remarked in any town of half the size in the course of our tour in the United States. Being here on week-days only, I had no opportunity of observing whether on Sundays there are any meetings for social worship. I heard that when the people of Evansville once reproached the citizens of this place for having no churches, they observed that they had also no shops for the sale of spirituous liquors, which is still a characteristic of New Harmony; whereas Evansville, like most of the neighbouring towns of Indiana, abounds in such incentives to intemperance.

April 3.—Left New Harmony for Evansville, on the Ohio, Mr. Maclure having kindly lent us his carriage and horses. We were accompanied by Dr. Dale Owen and Mr. Bolton. On the way, we visited Kimball's mill, in the township of Robinson, in Poser county, fourteen miles north-west of Evansville, where a fine example is seen of upright fossil trees belonging to a species of *Sigillaria*. These are imbedded in strata of argillaceous shale, or hardened mud, which constitute the upper part of the great Illinois coal-field, and above them lies a horizontal layer of sandstone, while a seam of coal, eighteen inches thick, is observed about eighteen feet below the roots. Having borrowed spades from the neighbouring mill, we dug out the earth from round one of the buried trees, and exposed a trunk four feet eight inches high, from the bottom of which the roots were seen spreading out as in their natural position. There were two other fossil trees near it, both apparently belonging to the same species of *Sigillaria.* The bark converted into coal, displayed the scars left by the attachment of the leaves, but no internal structure was preserved in the mud, now forming a cylindrical mass within the bark. The diameter of the three trunks was from 18 inches to 2 feet, and their roots were interlaced. A great number of others, found in like manner in an erect posture, have been removed in working the same quarry. The fossil plants obtained here, and in other parts of the Indiana coal-field, are singularly like those in other carboniferous strata in Ohio, Pennsylvania, Nova Scotia, and Europe. Among them occur species of ferns of the genera *Pecopteris* and *Cyclopteris*, and three plants, *Neuropteris flexuosa*, *N. cordata*, and *Lepidodendron obovatum*, all European species, and common to the Alleghanies and Nova Scotia.

The three large fossil trees above described as newly exposed to view, were standing erect under the spreading roots of one living oak, and it is wonderful to reflect on the myriads of ages which have intervened between the period when the ancient plants last saw the light, and the era of this modern forest, the vegetation of which would scarcely afford, except in the case of the ferns, any generic resemblance, yet where the trees are similar in stature, upright attitude, and the general form of their roots.

As we approached Evansville, we passed a German farm, where horses were employed to tread out the maize, and another where vines were cultivated on the side of a hill. At one turn of the road, in the midst of the wood, we met a man with a rifle, carrying in his hand an empty pail for giving water to his horse, and followed at a short distance by his wife, leading a steed, on which was a small sack. "It probably contains," said our companions, "all their worldly goods; they are movers, and have their faces turned westward, a small detachment of that great army of emigrants, which is steadily moving on every year towards the Rocky Mountains. This young married couple may perhaps go down to the Mississippi, and buy, for a few dollars, some acres of land, near a wooding station. The husband will fell timber, run up a log cabin, and receive ready money from the steam-boats, which burn the wood. At the end of ten or fifteen years, by which time some of their children will have become profitable servants, they may have put by 2000 dollars, bought a farm, and be living in a frame-house."

The very moment of our arrival at Evansville, a fine steam-boat, the Sultana, came in sight, and we found, among the passengers, some agreeable acquaintances, whom we had known at New Orleans and Natchez.

As some of these large vessels are much more expensive than others, Americans of the richer class, when making a long voyage, choose them purposely, as in England we take places in a first class railway carriage, that they may be less thrown into contact with ruder travellers. One of our friends, a naval officer, speaking of the improvement of society in the

Western States, said that duelling and drinking had greatly diminished in the last fifteen years. He related one of the strange scenes he had witnessed at a dinner-party, only a few years ago, at the house of a judge, in a town on the banks of the Mississippi. A quarrel had arisen, when one of the guests took out a pen-knife, and stabbed the judge in the side, so that the blood spirted out. The judge himself immediately drew out a bowie knife, and his antagonist, at the same instant, a pistol, and it then appeared that every other individual was armed with knives or pistols. The narrator admitted, that as he was travelling, he had also pistols upon him. Fortunately, some cool judicious persons of the party interposed in time to prevent farther mischief.

I fell into conversation with an intelligent well-dressed passenger, who, as we sailed by the town of Utica, in Indiana, remarked that it was too near the large city of Louisville to thrive greatly; and in speculating on the future prospects of the West, he said that by the census of 1840, it was proved that the Atlantic States had about nine and a half millions of inhabitants, while the States lying west of the mountains, and between the great lakes and the Gulf of Mexico, numbered about six millions four hundred thousand. Now, it is believed that the census of 1850 will show the population of the whole country to have changed its centre to the west of the mountains, and, under a system of universal suffrage, the centre of population becomes the centre of political power. After having been much interested with the information which I gained from this companion, although occasionally struck with his violation of the rules of ordinary good manners, I was trying to divine to what class in society he might belong, when he began to enlarge on the number of hogs killed last year in Cincinnati, which exceeded all former seasons, amounting to 300,000, and to describe to me how the streets, in killing time, were blocked up with barrels of salt pork for exportation, so that it was not easy to pass in a carriage. He then asked me abruptly, "How many hogs do you think I killed last season?" Imagining that he might be a farmer, I said, 300. He exclaimed, "18,000, and all of them despatched in thirty-five days!" He next began to boast that one of his men could eviscerate more hogs in one day than any other hand in Kentucky; and, placing himself in the attitude of his favourite executioner, he gave me such a minute description of his mode of operating, and dwelt on it with so much zest, as to make me feel satisfied that, as Thomas Diafoirus, in the "Malade Imaginaire," proposed to treat his mistress with "a dissection," so this member of the "pork aristocracy" of the West, would never doubt that such feats of professional dexterity as he loved to dilate upon, must command the admiration of all men who have the slightest feeling for superior artistical skill.

The distance from Evansville to Louisville was 205 miles, and on both sides of the river were hills of limestone or sandstone, of the coal formation, 300 feet high, frequently presenting steep and picturesque cliffs. Everywhere I observed a flat terrace of loam, or loess, bordering the river, sometimes on the side of Kentucky, sometimes on that of Indiana.

I had found this ledge, both at Mount Vernon and at Evansville, to contain land and freshwater shells. At the last-mentioned town, where the terrace was from twenty to thirty feet high, one of the lower beds of coarse materials was full of *Paludinæ* and the valves of a *Unio*, both of living species; yet with them were included, in the same gravelly and shelly mass, the well-preserved bones of the megalonyx.

The coal-measures had given place to an older series of strata, the Devonian, when we reached the Falls of the Ohio, at Louisville, where we saw the river foaming over its rocky bed. I first landed at New Albany, in Indiana, nearly opposite Louisville, that I might visit Dr. Clapp, and see his splendid collection of fossil corals. He accompanied me to the bed of the river, where, although the water was not at its lowest, I saw a grand display of what may be termed an ancient coral reef, formed by zoophytes, which flourished in a sea of earlier date than the carboniferous period. The ledges of horizontal limestone, over which the water flows, belong to the old red sandstone, or Devonian group, and the softer parts of the stone have decomposed and wasted away, so that the harder calcareous corals stand out in relief. Many branches of these zoophytes project from their erect stems precisely as if they were living. Among other species I observed large masses not less than five feet in diameter, of *Favosites gothlandica*, with its beautiful honeycomb structure well displayed, and, by the side of it, the *Favistella*, combining a similar honeycombed form with the star of the *Astræa*. There was also the cup-shaped *Cyathophyllum*, and the delicate network of the *Fenestella*, and that elegant and well-known European species of fossil, called "the chain coral," *Catenipora escharoides*, with a profusion of others, which it would be tedious to all but the geologist to enumerate. These coralline forms were mingled with the joints, stems, and occasionally the heads, of lily encrinites. Although hundreds of fine specimens have been detached from these rocks, to enrich the museums of Europe and America, another crop is constantly working its way out, under the action of the stream, and of the sun and rain, in the warm season when the channel is laid dry. The waters are now twenty feet above their lowest, and more than forty feet below their highest level, so that large spaces of bare rock are exposed to view.

On one of the window-sills of Dr. Clapp's library was displayed a group of these ancient corals, and, in the other window, a set of recent corals from the West Indian seas, of the genera *Meandrina, Astræa, Madrepora,* and others; some of them as heavy and stony as those of older date, their pores, foramina, and minute microscopic structure, not being more distinctly preserved. No one but a zoologist would have been able to guess which set were of modern, and which of ancient origin. Yet so old are the fossils, that they are referable to an era antecedent to the Alleghanies, the Alps, and the Pyrenees, nay, even to the time when by far the greater part of the materials composing these mountain-chains were slowly elaborated beneath the ocean.

CHAP. XXXVI.

Louisville.—Noble Site for a Commercial City.—Geology.—Medical Students.—Academical Rotation in Office.—Episcopal Church.—Preaching against the Reformation.—Service in Black Methodist Church.—Improved Condition of Negroes in Kentucky.—A coloured Slave married as a free White.—Voyage to Cincinnati.—Naturalised English Artizan gambling.—Sources of Anti-British Antipathies.—Progress of Cincinnati.—Increase of German Settlers.—Democracy of Romanists.—Geology of Mill Creek.—Land Tortoises.—Observatory.—Cultivation of the Vine.—Sculpture by Hiram Powers.

April 5. 1846.—FROM New Albany we crossed the river to Louisville, the metropolis of Kentucky, and found the Galt House the best hotel we had been in since we left the St. Louis at New Orleans. On our way through the streets, we saw written in large letters, over a smith's shop, the word "blacksmithy," and another inscription ran thus:—"Cash paid for coon, mink, wild-cat, beaver, musk-rat, otter, bear, wolf, and deer-skins;" which reminded us that this city, being the first place where large vessels coming up the river are stopped by the Falls, is the natural emporium for the produce of the western hunting grounds. A more noble site for a great commercial town cannot be imagined; and several merchants expressed to me their opinion, that Cincinnati, founded at a later date, would not have outstripped her rival in the race, so as to number now a population of nearly 100,000 souls, more than double that of Louisville, but for the existence of slavery, and a large negro population in Kentucky. Besides the disadvantages always arising from the partition of a country between two races, evils which emancipation cannot put an end to, Kentucky suffers from the decided preference shown to the right bank of the river by the best class of new settlers from the north-eastern States, who choose the Free State of Ohio for their residence, instead of the Slave State on the left bank.

I made a geological excursion with Dr. Yandell, one of the Professors of the University of this place, into the neighbourhood, going to the summit of a hill called Button-Mould Knob, so named from the joints of encrinites with which the lower strata of the carboniferous formation are charged. Here we enjoyed a wide prospect of the surrounding country. which, if all the valleys were filled up, would form an even table-land, the nearly horizontal strata having been evidently planed off at a certain level by the denuding action of the sea. The valley of the Ohio forms the principal break in a region otherwise void of any striking feature in its natural scenery. A few spring flowers only were to be seen, the most plentiful being the *Houstonia* and the *Claytonia.*

We went to an evening party at the house of one of the Professors of the University, and met many of his colleagues, and some medical students. Two of the latter informed me, that they had been sent to London to finish their course of study, having been brought up to feel great respect and veneration for English educational establishments. They had been received kindly and politely by the professors, but the prejudices of the majority of their fellow-pupils against the institutions of the United States, and still more their rude remarks about the vulgarity of all Americans (of whom they knew scarcely any thing), had so wounded their national feelings, that they had written home to entreat their parents to allow them to attend classes at Paris, or in some German University, to which they had reluctantly assented. These young men, being of good families in Kentucky, were gentlemanlike in their manners, in this respect decidedly above the average standard of students of the same profession in England, and they spoke with no bitterness even on this annoying topic. Talking over academical matters, some elders of the company complained of the wish of the democratic party to apply their favourite dogma of "rotation in office," or "let every man have his turn," not only to members of the executive and the election of judges, but actually to University professors. "You may amuse your countrymen," said they, "on your return, by telling them of the wisdom of our sovereign rulers, who would shorten to a minimum the term of service even of men who fill literary or scientific chairs." I informed them that nearly the whole University lectures at Oxford and Cambridge had, in modern times, been transferred from a body of professors to the temporary occupants of tutorships, who looked forward to the resigning of their academical functions as soon as they could afford to marry, or could obtain church preferment; so that the extreme democracy of Kentucky would at least have no claim to originality, should they apply their maxim of rotation in office to a body of academical lecturers.

On Sunday we attended service in an Episcopal church. The young preacher dwelt largely on the supreme authority of the Church, and lamented that many dogmas and pious usages, which had received the unbroken sanction of fifteen centuries, should have been presumptuously set at naught by the rebellious spirit of the sixteenth century, the great intellectual movement of which he described as marked by two characteristics, "nonsense and philosophy;" nor was it easy to discover which of these two influences, in their reference to matters ecclesiastical, were most evil in his sight. After a long dissertation in this strain, he called up to him a number of intelligent-looking young girls to be catechized, and I never saw a set of children with more agreeable or animated countenances, or who displayed more of that modest reverence and entire unreflecting trust in their teacher, which it is so pleasing to see in young pupils. That some of the questions should have reference to the doctrines just laid down in the preceding discourse, was to be expected. One of the last of the interrogatories, "Who wrote the Prayer-book?" puzzled the whole class. After waiting in vain for an answer, the minister exclaimed, "Your mother;" and made a short pause, during which I saw the girls exchange quick glances, and I found time to imagine that each might be exclaiming mentally to herself, "Can he mean my mother?" when he added, in a solemn and emphatic tone, "Your mother, the Church!" Had this congregation belonged to any other than the Anglican Church, I might simply have felt regret and melancholy at much that I had witnessed; as it was, I came out of the church in a state of no small indignation. I had heard, in the course of my travels, several discourses equally at variance with the spirit of the Reformation, but none before in which the Reformation itself was so openly denounced, and I could not help reflecting on the worldly wisdom of those who, wishing in the middle of the nineteenth century to unprotestantise the members of a reformed church, begin their work at an age when the mind is yet unformed and plastic — dealing with the interior of the skull as certain Indian mothers dealt with its exterior, when they bound it between flat boards, and caused it to grow not as nature intended, but into a shape which suited the fashion of their tribe.

In the evening we were taken, at our request, to a black Methodist church, where our party were the only whites in a congregation of about 400. There was nothing offensive in the atmosphere of the place, and I learnt, with pleasure, that this commodious building was erected and lighted with gas by the blacks themselves, aided by subscriptions from many whites of different sects. The preacher was a full black, spoke good English, and quoted Scripture well. Occasionally he laid down some mysterious and metaphysical points of doctrine with a dogmatic air, and with a vehement confidence, which seemed to increase in proportion as the subjects transcended the human understanding, at which moments he occasionally elicited from his sympathising hearers, especially from some of the women, exclamations such as "That is true," and other signs of assent, but no loud cries and sobs, such as I had heard in a white Methodist church in Montgomery, Alabama. It appeared from his explanation of "Whose superscription is this?" that he supposed the piece of money to be a dollar note, to which Cæsar had put his signature. He spoke of our ancestors in the garden of Eden in a manner that left no doubt of his agreeing with Dr. Prichard, that we all came from one pair,—a theory to which, for my own part, I could never see any ethnological or physiological objection, provided time enough be allowed for the slow growth of races; though I once heard Mr. A. W. Schlegel, at Bonn, pronounce it to be a heresy, especially in an Englishman who had read the "Paradise Lost," to agree with Prichard that our first parents were negroes. "I could have pardoned him," said the Professor, "for believing that Adam was the forefather of all the Africans, had he only conceded that 'the fairest of her daughters, Eve,' never could have been a negress."

Towards the close of the discourse, the minister said "that a protracted meeting would soon be held; but such assemblies were, in his judgment, becoming too frequent." He also announced that on Easter Sunday there would be a love-feast, which no doubt would be very crowded, "and where I hope you will all enjoy yourselves." He then said, "Sirs and Madams, I have now to warn you of a serious matter, but I see many of you are nodding, and let every one wake up his neighbour. The sexton, poor man, has more than he can do." This official, by the way, had been administering with his cane many admonitory taps on the heads of the younger part of the congregation, such as must have precluded them from napping for some time, if their skulls are not harder than those of their white brethren. There was a general stir, and two fat negro women, between whom my wife was wedged in (for the two sexes sat on separate sides), looked to see if she was awake. "There is a storm brewing," said the preacher, "owing to some late doings in Ohio, and I hope that none of the membership will get themselves into a scrape." The exciting topic on which he then enlarged was the late seizure, or kidnapping, as it was termed, of Jerry Phinney, who, after residing some years in Ohio, had been reclaimed by the heirs of his owners, in consequence of some flaw in his letters of freedom, and brought back to Kentucky. An attempt at a rescue was for a time apprehended, but 500 dollars were soon raised and paid to secure his release.

When I commended the action of the black preacher as graceful, I was assured that he had successfully imitated an eminent American player who had lately performed at Louisville. "These blacks," said my informant, "are such inimitable mimics, that they will sometimes go through a whole sermon in the same style as they have heard it delivered by a white man, only appearing somewhat to caricature it, because they are more pompous and declamatory; which in them is quite natural, for they are a more demonstrative race than we are. If he addressed them in a plain colloquial manner, his sermon would seem tame and make no impression. They cannot talk about the price of a pair of shoes, or quid of tobacco, without such gesticulations that you would fancy it was a matter of life and death they were discussing." There was a second coloured man in the pulpit, who delivered a prayer with a strong nasal twang, and very extravagant action. The hymns were some of them in rather a wild strain, but, on the whole, not unmusical.

I learnt that the domestic servants of Louisville, who are chiefly of negro race, belong very commonly to a different church from their owners. During our short stay here, an instance came to my knowledge of a master who, having an untractable black servant; appealed to a negro minister, not of his own church, to interfere and reprove him for his bad conduct, a measure which completely succeeded. We were told of four Sunday schools for coloured people in the city, and in one of them 170 children receive instruction. There are also other schools on week days for teaching negroes to read, both in Kentucky and Tennessee. When I communicated these facts to Americans in Philadelphia, they were inclined to be incredulous, and then said, "If such be the condition of negroes in Kentucky, they must be better off in slave States than in others called free; but you must not forget that their most worthless runaways take refuge with us."

A recent occurrence in Louisville places in a strong light the unnatural relation in which the two races now stand to each other. One of the citizens, a respectable tradesman, became attached to a young seamstress, who had been working at his mother's house, and married her, in the full belief that she was a white and a free woman. He had lived happily with her for some time, when it was discovered that she was a negress and a slave, who had never been legally emancipated, so that the marriage was void in law. Morally speaking, it was certainly not void; yet a separation was thought so much a matter of course, that I heard the young man's generosity commended because he had purchased her freedom after the discovery, and given her the means of setting up as a dressmaker. No doubt the lady knew that she was not of pure blood, and we were told that only six years before she had run away from her owner. She had also concealed this fact from her lover, but at a time probably when her affections were deeply engaged. On the other hand, we may pity the husband who suddenly finds that he is disgraced by having made an unlawful marriage, that his children are illegitimate, and that the wife of his choice belongs to an inferior caste in society. This incident is important in many points of view, and especially as proving to what an extent the amalgamation of the two races would take place, if it were not checked by artificial prejudices and the most jealous and severe enactments of law. I found that many here believe and hope that the time of emancipation is near at hand; but I was sorry to discover that the most sagacious seemed to think that the blacks in these middle States will not be able to stand alone when no longer protected by enjoying the monopoly of the labour market.

April 7.—Sailed in the Ben Franklin steamer from Louisville to Cincinnati, a distance by the river of 130 miles. The scenery much resembled that below the Falls; the valley of the Ohio being bounded by flat-topped hills, 200 or 300 feet high, formed of horizontal beds of sandstone or limestone, with steep slopes or cliffs towards the river, and at the base of these a flat terrace of gravel or loam on one or both sides of the Ohio, above high-water mark.

We made twelve miles an hour against the stream, and if we were descending, the captain says, we should go at the rate of eighteen miles an hour. Among the passengers I saw a thin sallow-faced anxious-looking artizan, whom I mistook for a native-born Yankee, holding forth to a small circle of idlers about "*our* revolution" and "*our* glorious victories over the British," and calling upon all to prove themselves "true democrats." Soon after we started I saw him take a dram, and then sitting down to cards lose sixty dollars in half an hour. The officers of the ship, observing this transaction, interfered and put a stop to the game, giving orders to the steward not to sell any more brandy to this passenger. I afterwards learnt that he was an Englishman, a skilful, first-rate mechanic in the iron trade at Pittsburg, who had come out from Liverpool about sixteen years ago. After drinking and losing all his earnings at the gaming-table, he has returned again and again to work, and can always command high wages. He has read up the history of the American revolution, and at an election can harangue a mob of newly come emigrants with great effect, and with all the authority of a native, assuming a tone of intense nationality. On other occasions I had met with a naturalised Englishman of a different stamp, who might equally be described as "ipsis Americanis Americanior," one who, having been born in the middle classes, has gone over early in life to the New World, where he has succeeded in business, risen to a good social position, and given his children an excellent education. He then goes back to visit the "old country," and see his friends and relatives, and is surprised and mortified that they are separated by so great a gulf from the higher classes, greater than exists between the humblest and most elevated in his adopted country. He finds, also, the religious sect to which he and his kindred belong, only tolerated, and not standing on the same footing of "gentility" as the dominant church. His sectarian zeal, his feelings of social pride, and his political principles are all up in arms, and he comes back to America far more patriotic and more of an optimist than any native. If he then ventures to enter on the political arena, his opponents warn the electors against one who is an alien by birth and feeling, and, in his efforts to disprove such imputations, he reaches the climax of anti-British antipathy.

Such citizens were unaffectedly incapable of comprehending that I could have seen so much of the Union, and yet have no wish whatever to live there. Instead of asking, "Would you not like to settle here?" it would be more prudent for them to shape their question thus: "If you were to be born over again, and take your chance, by lot, as to your station in society, what country would you prefer?" Before choosing, I should then have to consider, that the chances are many thousands to one in favour of my belonging to the labouring class, and the land where they are best off, morally, physically, and intellectually, and where they are most progressive, would be the safest one to select. Such being the proposition, the Free States of the Union might well claim a preference.

Every town we had visited in the last three months, since we left Savannah, in January, was new to us, and Cincinnati was the first place where we were able to compare the present state of things with that observed by us in the summer of 1842. In this short interval of four years, great improvements in the buildings, streets, and shops were visible; a vast increase of population, and many additional churches, and new cotton factories. The soil of the country immediately behind the town is rich, and there is an ample supply of labourers, partly indeed because the Catholic priests strive to retain in the city all the German emigrants. Although they are industrious and thrifty, such an arrangement is by no means the best for promoting the progress of Ohio, or her metropolis; for, next to having an "Irish quarter," a "German quarter" in a large city is most undesirable. The priests, no doubt, judge rightly, both in reference to their notions of discipline, and with a view of maintaining their power; for these peasants, when scattered over the country, and interspersed with Protestants, cannot be made to confess regularly, attend mass, and read orthodox German newspapers, three of which are published here daily, and one weekly, all under ecclesiastical censorship. There are a large number of German Protestants, and 20,000 Catholics, in all twelve churches, where the service is performed in the German language. Only half of these are Romanist churches, but they are much more crowded than the others. The chief emigration has been from Bavaria, Baden, Swabia, Wirtemberg, and the Black Forest, and they are almost all imbued with extreme democratic notions, which the ordinary European training, or the working of semi-feudal institutions, evidently fosters in the minds of the million, far more than does the republicanism of the United States. The Romanist priests feel, or affect, sympathy with this political party, and in the last election they instructed the Germans and the Irish to vote for Polk against Clay. It ought, indeed, to serve as a warning, and afford serious matter of reflection to the republicans of America, that a church which requires the prostration of the intellect in matters of faith and discipline, and which is most ambitious of worldly power, is also of all others the most willing to co-operate with the ultra-democratic party. Are the priests conscious of having embarked in a common cause with the demagogue, and that they must, like him, derive their influence from courting the passions, prejudices, and ignorance of the people? If so, one method alone remains for combating both — the removal of ignorance by a well-organized government system of schools, neither under sectarian or ecclesiastical control, nor under the management of any one political party.

In the city, the New Englanders appeared to me to have lost political weight since we were last here. To show me how seriously the priests interfere in their domestic affairs, a bookseller told me that he had just lost the services of a young shopman who, although a Protestant, like his father, found that his mother, a Catholic, considered it her duty never to let him rest till he adopted some other profession. The priest had told her that he was constantly handling dangerous and heretical books in his store, with which his mind must be contaminated.

In many of the large towns, in the valley of the Mississippi, the Catholics have established such excellent schools, and enforced discipline so well, that the children of Protestants have been attracted there, and many have become proselytes; but I heard of still more Catholics who have become converts to Protestantism, and I cannot but believe that Romanism itself will undergo many salutary modifications under the influence of the institutions of this country.

I made an excursion with Messrs. Buchanan, James, Carley, Clark, and Anthony, to Mill Creek, a tributary valley of the Ohio, where loam and gravel, with freshwater shells, overlies a deposit of leaves and fossil stems of trees. The shells are of recent species, and the layer of vegetable matter of the same age as that which contains the bones of the mastodon, elephant, megalonyx, and other extinct animals at Big Bone Lick, in Kentucky.* I afterwards saw in the city some beautiful collections of Silurian fossils from the blue limestone, and was struck with the dimensions of some of the trilobites of the genus *Isoteles,* the most perfect specimen being eight inches long, and many large fragments of other individuals indicating a length of not less than eighteen or twenty inches.

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* See ante, p. 257—258. and "Travels in North America," vol. ii. pp. 62. 65. 67.

In Mr. Clark's garden were several land-tortoises (*Testudo clausa,* Say), which had lived there for ten years; and, after a hybernation of some months, had just re-appeared. They were crawling about in search of snails, but will also eat strawberries and meat, both raw and cooked. They grow very slowly; the largest are eight inches long, and some of the young ones not bigger than a half-crown piece. Mr. Clark tells me, that the female lays four eggs, and digs a hole for them in the ground, hollowing it out with her hind feet to the depth of four inches, and shaping it so that it enlarges below. After being occupied for about a week in this excavation, she deposits the eggs and fills up the hole with earth, beating it down with her hind feet to make it firm. The spot is well concealed by a covering of soil two inches thick, which does not prevent the sun's heat from hatching the eggs as the summer advances.

In one of the cabinets of Ohio insects, I saw specimens of that common English butterfly, *Vanessa atalanta,* or "red admirable," which I had observed, in the winter, flying about in the woods of Alabama. I could not distinguish it from the European species, yet Mr. Doubleday, the entomologist of the British Museum, at once recognised all I showed him as American specimens; for there is a minute, but constant difference, first pointed out by Mr. J. F. Stephens, in the markings of the beautifully coloured anterior wing. On an accumulation of facts of this kind must depend ultimately the answer to that difficult question, What is the difference between a species and a permanent variety? How far can climate, food, heat, light, and other causes give rise to fixed and constant modifications in individuals descended from one parent stock?

We ascended the hill, on which a new observatory has been built by subscription since we were last here, and where there is an equatorial telescope seventeen feet long and twelve inches in diameter. Dr. Mitchell, the astronomer, proposes to explore a part of the heavens more to the south than that which falls within the range of any active European observatory. From this hill we had a fine view of the winding valley of the Ohio, and the city on its banks, with nearly 100,000 inhabitants, the flat terraces of loam and gravel bordering the river, and the wharf with its fleet of steamers. On the opposite side of the Ohio is the town of Covington in Kentucky, the streets of which are made so to correspond with those of Cincinnati, that they appear as if they were parts of the same city, and a bridge over the river is in contemplation.

The height of the hills above the river is about 400 feet. The trees are still in great part leafless, but our eyes were refreshed with the green sward adorning the sloping banks, such as we had not seen during our winter tour in the Southern States.

The German settlers have greatly extended the cultivation of the vine on the steep and terraced sides of these hills, and they make wine, preferred by themselves, at least, to beer, and to many German wines. Some lands near the river, recently rugged and sterile, but suited to the grape, have risen immensely in value, being now trenched and walled. This work has been done in the winter when there was no other employment. Some are of opinion, that the native American grape ought to have been cultivated and improved instead of importing foreign kinds. A rich citizen, who had spoken very contemptuously of the home-made article, was lately hoaxed by having some of it passed off upon him as Rhenish hock, which he declared was excellent, while some genuine hock of the Rhine, given him as home-made, was pronounced to be "sour cider."

The small number of coloured people is striking to one coming direct from Louisville, and I was glad to hear that a stand had recently been made against the prejudices which prevent the improvement of the mixed race. A free school for girls having been established at the expense of the city, some of the parents complained that the trustees had admitted two children of colour; and, in fact, there were among them two daughters of a white father and mulatto mother. One of the managers told me, that taking the complainants into the school, he asked them to point out which of the pupils they supposed to have African blood in their veins; they confessed themselves unable to guess, for the two girls were not only among the best scholars, but better looking and less dark than many of the other pupils.

At Mr. Longworth's we saw a beautiful piece of sculpture, an ideal head called Ginevra, by Hiram Powers, who had sent it from Rome as a present to his first patron. It appeared to me worthy of the genius of the sculptor of "Eve" and the "Greek Slave." Thorwaldsen, when he saw Power's "Eve," foretold that he would create an era in his art; and not a few of the Italians now assign to him the first place in the "Naturalista" school, though assuredly there is much of the ideal also in his conceptions of the beautiful. It augurs well for the future cultivation of the fine arts in the United States, that the Americans are as proud of their countryman's success as he himself could desire.

CHAP. XXXVII.

Cincinnati to Pittsburg. — Improved Machinery of Steamer. — Indian Mound. — Gravel Terraces. — Pittsburg Fire. — Journey to Greensburg. — Scenery like England. — Oregon War Question. — Fossil Foot-prints of Air-breathing Reptile in Coal Strata. — Casts of Mud-cracks. — Foot-prints of Birds and Dogs sculptured by Indians. — Theories respecting the Geological Antiquity of highly organized Vertebrata. — Prejudices opposed to the Reception of Geological Truths.—Popular Education the only Means of preventing a Collision of Opinion between the Multitude and the Learned.

April 13. 1846.—FROM Cincinnati we embarked in the Clipper steamer for Pittsburg, a distance of no less than 450 miles; so magnificent is the scale of the navigation of this mere tributary of the Mississippi! Yet there are other large steamers also plying above Pittsburg, on the tributaries of the Ohio. We observe more punctuality than in 1842, in the starting of the steamers. The Clipper made ten miles an hour against the current, including stoppages. We fell in with some large artificial rafts of wood stretching more than half across the river, and met a steamer, which had run foul of one of them, still entangled, and, though bound for Pittsburg, floating down the stream with the raft. Our steamer only draws 3½ feet water, and her engines are of a very peculiar construction, hitherto used in sea-boats only, with the exception of one on Lake Erie. The inventor of this improvement is Thomas K. Litch. There are two cylinders, one twice the size of the other, and the steam escapes from the smaller into the larger, instead of issuing into the open air, so that its heat is not lost. The economy of fuel arising from this contrivance is great, and the vibrations and noise much less than in other boats on the same high-pressure principle. In place of the usual bell, signals are made by a wild and harsh scream, produced by the escape of steam, as in locomotive engines; a fearful sound in the night, and which, it is to be hoped, some machinist who has an ear for music will find means to modulate. There was a Pennsylvanian farmer on board who told me that, having a large family to provide for, he had resolved to settle in Indiana, and was returning from that State, after making a purchase of land in "the rolling prairies." He had paid the usual government price of 1¼ dollar, or about *5s. 6d.* an acre; whereas he could sell his own property in Pennsylvania, which had a house on it, at the rate of 60 dollars an acre. He had been much concerned at finding a strong war party in the West, who were eager to have a brush with the English. "It was a short-sighted policy," he remarked, "in your country, to exert so little energy and put forth so small a part of her strength in the last war with the United States. It will one day involve both you and us in serious mischief."

At a point about twenty-four miles below Wheeling, we came to the largest of the Indian mounds on the Ohio, of which I have spoken in my former

"Travels."* It is between 60 and 70 feet high, rising from a flat terrace of loam, and a very striking object, reminding one, by its shape, of the pyramidal Teocallis of the ancient Mexicans, of which Humboldt has given figures, and which are so well described by Prescott, in his "History of Cortes." As we approached Wheeling, the valley of the Ohio became narrower, and the hills, composed of strata of the coal formation, sensibly higher. The State of Ohio was on our left hand, or on the northern bank of the river, and that of Virginia on our right. The flat terrace of loam and gravel, extending everywhere from the base of the hills to the river's bank, forms a picturesque contrast to the steep slope of the boundary hills, clothed partly with ancient timber, and partly with a second growth of trees of less height, which has sprung up where clearings have been made. It is worthy of remark, that the materials of the great terrace of loam and gravel become more and more coarse as we approach nearer the mountains between Wheeling and Pittsburg, and at the same time the terrace itself is more and more elevated above the level of the river. It appeared to be about 60 feet high, near the mouth of the Great Kanawha, and about 80 feet high at Georgetown, 40 miles below Pittsburg, which I can only explain by reference to the theory before advanced†; namely, by supposing the amount of subsidence, as well as of the subsequent upward movement, to have been greater inland, or farther north, than in the south, or nearer the Gulf of Mexico.

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* Vol. ii. p. 32.

† See ante, p. 259.

April 16.—There had been so hard a frost in the night, that the roof of our steamer's cabin was glazed with a thin sheet of ice as we approached Pittsburg, and we heard fears expressed that the fruit trees would be injured. Four years had elapsed since we were last at Pittsburg, and, in the interval, a considerable part of the city, covering sixty acres, had been burnt to the ground, the great roofed bridge over the Monongahela, all built of wood, having shared the same fate. A light suspension bridge has already replaced that structure of ponderous aspect, and although the conflagration only happened in April of last year, new streets have sprung up everywhere from the ashes of the old, and the town has very far from a ruined or desolate look. Commanding the navigation of three great rivers, and an inexhaustible supply of coal, it has every advantage save that of an atmosphere free from coal smoke.

I learnt that there had recently been a strike of the factory girls here for ten instead of twelve hours of daily labour. Their employers argue that they are competing with rivals who work their girls twelve or more hours per day, and the strike has failed; yet many are of opinion, that even without legislative interference, a ten hour rule will be eventually established.

Most of our companions in the steamer were agents of commercial houses going to look out for orders at Pittsburg. On the whole they were very intelligent, and conversed well on a variety of subjects, while most of them were too gentlemanlike to feel ashamed of "the shop." But we had now been living so many weeks in public with strangers, and without opportunities of choosing our society, that great was our delight to be able to hire at Pittsburg a private carriage, and set out alone on an expedition to Greensburg, 32 miles distant, where I had a point of geological interest to investigate. As we were leaving the hotel, a news-boy, finding I was supplied with newspapers, offered to sell me a cheap American reprint of the miscellaneous works of Lord Jeffrey, assuring me that "it contained all the best articles he had written in the Edinburgh Review."

To be once more climbing hills even of moderate height, was an agreeable novelty after dwelling so long on the flat plains of the Mississippi. We were on the direct road, leading across the Alleghanies to Harrisburg. The scenery often reminded us of England, for we were travelling on a macadamized road, and passing through turnpike gates, with meadows on one side, and often on the other large fields of young wheat, of an apple-green colour, on which a flock of sheep, with their lambs, had been turned in to feed. The absence of stumps of trees in the fields was something new to us, as was the non-appearance for a whole day of any representative of the negro race. Here and there a snake-fence, and a tall strong stubble of maize, presented a point of contrast with an English landscape. In some of the water-meadows the common English marigold (*Caltha palustris*) was in full flower. At one turn of the road, a party of men on foot came in sight, each with his rifle, and they were followed, at a short distance, by a waggon with women and children, and a train of others laden with baggage. Our driver remarked that they were "movers," and I asked him if he ever knew an instance of an American migrating eastward. He said that he was himself the only example he ever heard of; for he was from Kentucky, having come the year before to satisfy his curiosity with a sight of the great Pittsburg fire. There he found a great demand for work, and so was tempted to stay.

Our road lay through East Liberty, Wilkinsburg, and Adamsburg. Some day-labourers, who were breaking stones on the road, told me they were receiving seventy-five cents, or three shillings, a day; and this in a country where food and fuel are much cheaper than in England, although clothing is rather dearer.

Near Turtle Creek, two farmers conducted me to a spot where coal was worked, and where the undulating ground consisted of sandstone, limestone, and shale, green and black, of the coal-formation, precisely resembling strata of the same age in England, both in mineral appearance, and in most of the species of imbedded fossil plants.

About fifteen miles before we reached Greensburg we saw, in the extreme distance, the blue, faint, long, and unbroken line of the most western ridge of the Alleghanies.

Greensburg is a neat, compact town of about 1000 inhabitants. The houses are all of brick; there is a court-house and five churches, some Lutheran, others Calvinistic, the German language being used in some, and the English in others. They publish three newspapers. We took up our quarters at a comfortable old-fashioned inn, where we were waited upon by the members of the family, for the difficulty of hiring or retaining servants here seems to be extreme. One girl had left a lady, whose acquaintance we made, because, being a farmer's daughter, she was not allowed to sit down at table with her mistress. The lady's sister, who was accomplished, and conversed with us on many literary subjects, was obliged to milk the cow for the whole summer, though they were in easy circumstances, such was the scarcity of "help." Fortunately for us, my wife and I had, by this time, acquired the habit of waiting on ourselves in the inns, going occasionally down to the kitchen to ask for things, in a way which in England would be thought quite derogatory to one's dignity, especially in the eyes of the servants, whose trouble would thereby be lessened. Here, on the contrary, we found that it made us popular. The general system in America that servants at inns receive no gratuities, but are paid ample wages instead, is one cause of this difference. Yet much may be said in its favour, as it raises the independence of the servants, and relieves strangers from the perplexity of determining what fees are suitable.

There was a crowded public meeting the day of our arrival, at which several orators were haranguing an audience of the lowest class, in favour of war with England about Oregon. The walls were placarded with bills, on which were printed, in large letters, these words, "Forty-Five? or Fight," which meant that the Oregon territory must extend farther north than the 45th degree of latitude.

This ambition of the people of the West to possess Oregon, is at least no new idea, for I happened to purchase at Louisville an old guide-book describing the Falls of the Ohio and the city, in which, when speaking of commercial matters, the colonization and annexation of Oregon was set forth as the means of "opening a direct trade with China." I observed to one of the citizens, that it was satisfactory to see that none of the upper, or even of the middle classes, were taking any part at Greensburg in this agitation. He shook his head, and said, "Very true; but these meetings are most mischievous, for you must bear in mind, that your nobody in England is our everybody in America."

I had determined to visit Greensburg, on my way from Pittsburg to Philadelphia, that I might examine into the evidence of the reality of certain fossil foot-prints of a reptile said to have been found in strata of the ancient coal-formation, and of which Dr. King, of Greensburg, had published an account in 1844. The genuineness of these foot-marks was a point on which many doubts were still entertained, both in Europe and America, and I had been requested by several geological friends not to return without having made up my mind on a fact which, if confirmed, was of the highest theoretical importance. Up to this period, no unequivocal proofs had been detected of the fossil remains of vertebrated animals more highly organised than fishes, in strata of such antiquity as the carboniferous rocks, and the absence of air-breathing quadrupeds or birds, served to constitute negative evidence, of peculiar significance, in reference to the coal-measures, because, as before stated*, they contained the monuments of shallow freshwater swamps, and often of surfaces of land covered with a luxuriant vegetation of *terrestrial* plants, some of the buried trees of which still remain with their roots in their natural position. That we should never have found, in such deposits, the remains of air-breathing creatures, except a few insects, that we should not yet have met with a single mammifer or bird, or lizard, snake, or tortoise, or the faintest indication of their existence, seemed most inexplicable, and led many geologists to embrace the opinion, that no beings having a higher organization than fishes, were created till after the carboniferous strata had been elaborated.

During my stay in Westmoreland county, I was indebted to Dr. King for the most active assistance in the prosecution of my inquiries. He kindly devoted several days to this object, and we first visited together a stone quarry in Union township, six miles south-east of Greensburg, on a farm belonging to Mr. Gallagher, where the foot-marks had been first observed, standing out in relief from the lower surface of slabs of sandstone, resting on thin layers of fine clay. These slabs were extracted for paving-stones, and the excavation was begun in the bank of a small stream, where there was at first a slight thickness only of shale overlying the harder beds;

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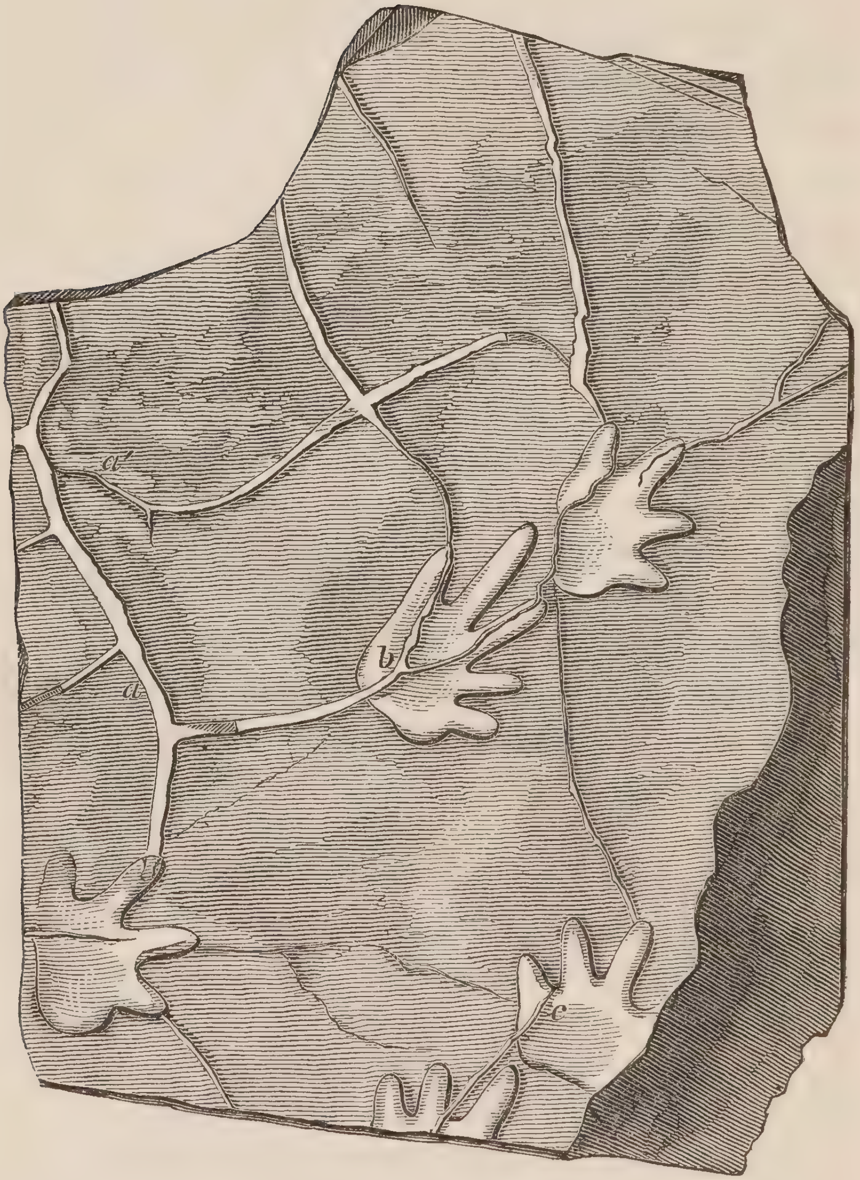
* See ante, p. 245—246.

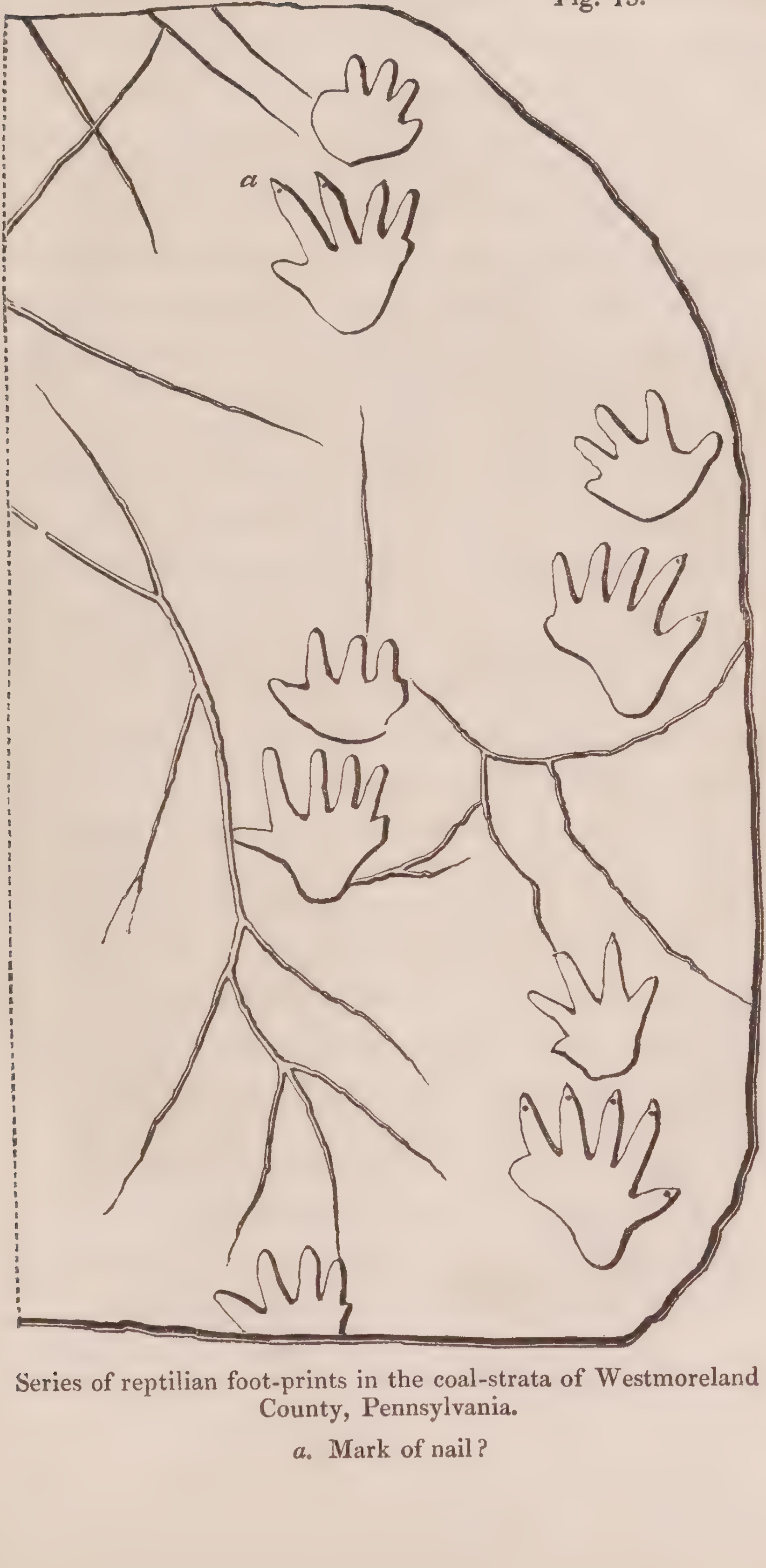
Fig. 12.



Scale one-sixth the original.

Slab of sandstone from the coal-measures of Pennsylvania, with foot-prints of air-breathing reptile and casts of cracks.

Fig. 13.



Series of reptilian foot-prints in the coal-strata of Westmoreland County, Pennsylvania.

a. Mark of nail?

but as they cut their way into the bank, the mass of shale became so dense as to oblige them to desist from the work. Between the slabs of stone, each a few inches thick, were thin parting layers of a fine unctuous clay, well fitted to receive and retain faithful impressions of the feet of animals. On the upper surface of each layer, Dr. King saw the footsteps impressed more or less distinctly; but, as the clay was left exposed to the weather, it had crumbled to pieces before I examined it, and I had only an opportunity of seeing the casts of the same projecting in relief from the undersides of slabs of argillaceous sandstone. I brought away one of these masses, of which the annexed figure (fig. 12.) is a faithful representation; and it will be observed that it displays not only the marks of the foot-prints of an animal, but also casts of cracks, *a*, *a′*, of various sizes, which must have existed in the clay. Such casts are produced by the drying and shrinking of mud, and they are usually detected in sandstones of all ages in which foot-marks appear. It will be seen that some of these cracks, as at *b*, *c*, traverse the foot-prints, and they not unfrequently produce distortion in them, as might have been expected, for the mud must have been soft when the animal walked over it and left the impressions, whereas, when it afterwards dried up and shrank, it would become too hard to receive such indentations. I have alluded, in my former "Travels,"* to the recent foot-prints of birds called sand-pipers (*Tringa minuta*), which I saw running, in 1842, over the red mud thrown down by every tide on the borders of estuaries connected with the Bay of Fundy. When this mud, which extends over thousands of acres, has been baked by the hot summer sun of Nova Scotia, it shrinks and cracks to the depth of several inches or even feet, and acquires such consistency as to be divisible into the successive layers of which it is composed, presenting on many upper surfaces impressions of birds' feet and cracks, and on the undersides the casts of the same standing out in relief.*

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* Vol. ii. p. 168.

I have also stated † that on the sea beach near Savannah, in Georgia, I saw clouds of fine sand drifted by the wind, filling up the foot-prints of racoons and opossums, which a few hours before had passed along the shore, after the retreat of the tide. This process will account, in a satisfactory manner, for the sharpness of many fossil casts of animals in ancient rocks, as the grains of uniformly fine sand were poured into the newly made cavities, not by a current of water, which could scarcely have failed to disturb the soft mud, but by the air, which could not cause the slightest derangement of the most delicate imprints.

No less than twenty-three foot-steps were observed by Dr. King on slabs in the stone quarry of Union township before mentioned, before its abandonment, and the greater part of these were so arranged (see fig. 13.) as to imply that they were the marks of the successive foot-steps of the same animal. Everywhere there was seen a double row of tracks, occurring in pairs, each pair consisting of a hind and fore foot, and each being at nearly equal distances from the next pair. The toes in each of these parallel rows turn the one set to the right, the other to the left. It is instructive to compare these impressions with those which had previously been met with in an ancient European rock (although one of less antiquity than the coal-formation), namely, the new red sandstone or Trias of Saxony and Cheshire. The accompanying figure (fig. 14.) represents the Saxon Cheirotherium, so called by Professor Kaup, because the marks both of the fore and hind feet resemble the shape of a human hand. Now in these European hand-shaped foot-marks, both the hind and fore feet have each five toes, and the size of the hind foot is about five times as large as the fore foot; but in the American fossil (fig. 13.), the posterior foot-print is not nearly twice as large as the anterior, and the number of toes is unequal, being five in the hinder and four in the anterior foot. In the Greensburg animal, as in the European Cheirotherium, the fifth toe stands out nearly at a right angle with the foot, and somewhat resembles the human thumb. On the external side of all the Pennsylvanian tracks, both the larger and smaller, there is a protuberance like the rudiment of another

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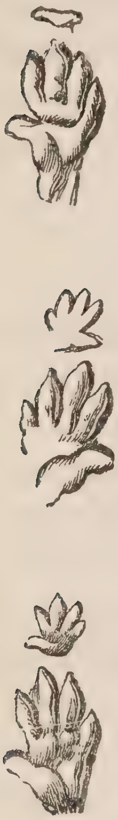
* I have presented specimens of this red mud, with the foot-prints of birds, to the British Museum, Geological Society, and Museum of Economic Geology.

† Travels, vol. i. p. 167.

Fig. 14.



Hildburghausen, Saxony.

toe. The average length of the hind foot is five and a half inches, and of the fore foot four and a half. The fore and hind feet being in pairs, follow each other very closely, there being an interval of about one inch only between them. Between each pair the distance is six to eight inches, and between the two parallel lines of tracks there is about the same distance.

In the case of the European Cheirotherium, whether English or German, the hind and fore feet occur in pairs, but they form only one row, as in fig. 14., in consequence of the animal having put its feet to the ground nearly under the middle of its body, and the thumb-like toes are seen to turn to the right and to the left in the alternate pairs. But in the American tracks, which form two parallel rows, all the thumb-like toes in one set turn to the right, and in the other set to the left. We may infer, therefore, that the American Cheirotherium belongs to a new genus of reptilian quadrupeds, wholly distinct from that which characterises the triassic strata of Europe, and such a generic diversity might have been expected in reptilian fossils of such different ages.

The geological position of the sandstone of Greensburg is perfectly clear, being situated in the midst of the Appalachian coal-field, having the main bed of coal, called the Pittsburg seam, three yards thick, a hundred feet above it, worked in the neighbourhood, and several other seams of coal at lower levels. The impressions of *Lepidodendron*, *Sigillaria*, *Stigmaria*, and other characteristic carboniferous plants, are found both above and below the level of the reptilian foot-steps.

We may safely assume that the huge reptile which left these prints on the ancient sands of the coal-measures was an air-breather, for its weight would not have been sufficient under water to have made impressions so deep and distinct. The same conclusion is also borne out by the casts of the cracks above described, for they show that the clay had been exposed to the air and sun, so as to have dried and shrunk. As we so often see the ripple mark preserved in sandstones of all ages, and in none more frequently than in the American and European coal strata, we ought not to feel surprise that superficial markings, such as foot-prints, which are by no means more perishable or evanescent in their nature, should have been faithfully preserved down to our times, when once the materials had been hardened into stone.

There are some bare ledges of rock, composed of pure white quartzose grit of the coal-measures, standing out exposed above the general level of the ground, in many places near Greensburg, especially near Derry, in Westmoreland county, about fourteen miles north of Greensburg. They are so bare that scarcely any lichens grow upon them, and on some of them the foot-prints of birds, as well as those of dogs and some other quadrupeds, have been artificially cut. After examining them carefully, I entertain no doubt that they were sculptured by Indians, for there are many Indian graves near Derry, and one of their paths, leading through the forest from the

Alleghany Mountains to the west, lay precisely in the line of these curious carvings. The toe joints in the feet of the birds thus cut are well indicated, as might have been expected, for the aboriginal hunting tribes of North America were skilful in following the trail of all kinds of game, and are known to have carved in some places, on rocks, many rude imitations of the external forms of animals. If, therefore, they were sometimes tempted to use the representation of foot-prints as symbols of the birds or quadrupeds which they hunted, they would be not unlikely to give very accurate copies of markings with which they were so familiar. The important observations made by Dr. King relatively to the fossil imprints, called the attention of the whole country to the Indian antiquities of comparatively modern date; but the popular notion that there was a connection between them is wholly erroneous.

Since the announcement, by Dr. King, in 1844, of the proofs of the existence of reptiles at the period when the coal strata of Pennsylvania were formed, Professor Goldfuss, of Bonn, has published the description of more than one saurian found in the ancient coal-measures of Saarbruck, near Treves.

Never, certainly, in the history of science, were discoveries made more calculated to put us on our guard for the future against hasty generalisations founded on mere negative evidence. Geologists have been in the habit of taking for granted, that at epochs anterior to the coal there were no birds or air-breathing quadrupeds in existence; and it seems still scarcely possible to dispel the hypothesis that the first creation of a particular class of beings coincides in date with our first knowledge of it in a fossil state, or the kindred dogma that the first appearance of life on the globe agrees, chronologically, with the present limits of our insight into the first creation of living beings, as deduced from organic remains. These limits have shifted, even in our own times, more than once, or have been greatly expanded, without dissipating the delusion, so intense is the curiosity of man to trace back the present system of things to a beginning. Rather than be disappointed, or entertain a doubt of his power to discern the shores of the vast ocean of past time, into which his glances are penetrating, like the telescope into the region of the remoter nebulæ, he cannot refrain from pleasing his imagination with the idea that some fog-banks, resting on the bosom of the deep, are, in reality, the firm land for which his aching vision is on the stretch.

I cannot conclude these remarks on the geological discoveries made in these remote valleys of the Alleghanies, without alluding to a moral phenomenon, which was forcibly brought before my mind in the course of the investigation. The interest excited by these singular monuments of the olden times, naturally led to animated discussions, both in lecture-rooms and in the columns of the daily journals of Pennsylvania, during which the high antiquity of the earth, and the doctrine of former changes in the species of animals and plants inhabiting this planet before the creation of man, were assumed as established truths. But these views were so new and startling, and so opposed to popular prepossessions, that they drew down much obloquy upon their promulgators, who incurred the censures, not only of the multitude, but also of some of the Roman Catholic and Lutheran clergy. The social persecution was even carried so far as to injure professionally the practice of some medical men, who had given publicity to the obnoxious doctrines. Several of the ministers of the Lutheran Church, who had studied for years in German universities, were too well informed not to believe in the conclusions established by geologists, respecting the immensity of past time and former vicissitudes, both in animal and vegetable life; but although taking a lively interest in discoveries made at their own door, and joining in the investigations, they were compelled by prudence to conceal their opinions from their congregations, or they would have lost all influence over them, and might perhaps have seen their churches deserted. Yet by maintaining silence in deference to the opinions of the more ignorant, they become, in some degree, the instruments of countenancing error; nay, they are rearing up the rising generation to be, in their turn, the persecutors of many of their contemporaries, who may hereafter be far in advance in their scientific knowledge.

"To nothing but error," says a popular writer of our times, "can any truth be dangerous; and I know not," he exclaims, "where else there is seen so altogether tragical a spectacle, as that religion should be found standing in the highways, to say, 'Let no man learn the simplest laws of the universe, lest they mislearn the highest. In the name of God the Maker, who said, and hourly yet says, *Let there be light,* we command that you continue in darkness!'" *

Goldsmith, in "The Vicar of Wakefield," makes his traveller say, that after he had walked through Europe, and examined mankind nearly, he found that it is not the forms of government, whether they be monarchies or commonwealths, that determine the amount of liberty enjoyed by individuals, but that "riches in general are in every country another name for freedom." I agree with Goldsmith that the forms of government are not alone sufficient to secure freedom — they are but means to an end. Here we have in Pennsylvania a free press, a widely extended suffrage, and the most perfect religious toleration, — nay, more than toleration, all the various sects enjoying political equality, and, what is more rare, an equality of social rank; yet all this machinery is not capable, as we have seen, of securing even so much of intellectual freedom as shall enable a student of nature to discuss freely the philosophical questions which the progress of science brings naturally before him. He cannot even announce, with impunity, results which half a century of observation and reasoning has confirmed by evidence little short of mathematical demonstration. But can riches, as Goldsmith suggests, secure intellectual liberty? No doubt they can protect the few who possess them from pecuniary penalties, when they profess unpopular doctrines. But to enable a man to think, he must be allowed to communicate freely his thoughts to others. Until they have been brought into the daylight and discussed, they will never be clear even to himself. They must be warmed by the sympathy of kindred minds, and stimulated by the heat of controversy, or they will never be fully developed and made to ripen and fructify.

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* Letter on Secular Education, by T. Carlyle July, 1848.

How, then, can we obtain this liberty? There is only one method; it is by educating the millions, and by dispelling their ignorance, prejudices, and bigotry.

Let Pennsylvania not only establish numerous free schools; but let her, when she organizes a system of government instruction, raise the qualifications, pay, and station in society of the secular teachers, as highly as Massachusetts is now aspiring to do, and the persecution I have complained of will cease at once and for ever.

The project of so instructing the millions might well indeed be deemed Utopian, if it were necessary that all should understand the patient and laborious trains of research and reasoning by which we have arrived at grand generalisations in geology and other branches of physical science. But this is not requisite for the desired end. We have simply to communicate the results, and this we are bound to do without waiting till they have been established for half a century. We ought rather carefully to prepare the public mind for new conclusions as soon as they become highly probable, and thus make impossible that collision of opinion, so much to be deprecated, between the multitude and the learned.

It is as easy to teach a peasant or a child that the earth moves round the sun, as to inculcate the old exploded dogma that it is the motionless centre of the universe. The child is as willing to believe that our planet is of indefinite antiquity, as that it is only 6000 years old. Tell him that the earth was inhabited by other races of animals and plants before the creation of man, as we now know it to have been, and the idea is not more difficult for him to conceive than the notion which is usually allowed to take root in his mind, that man and the species of animals and plants, now our contemporaries, were the first occupants of this globe. All that we require, when once a good system of primary and normal schools has been organized, is a moderate share of moral courage and love of truth, on the part of the laity and clergy; and then the academical chair and scientific lecture-room, and every pulpit, and every village school, may be made to speak the same language, in regard to those natural phenomena which are of a kind to strike and interest the popular mind.*

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* The substance of the above remarks, on the fossil foot-prints of Greensburg, was given by me in a Lecture to the Royal Institution, London, Feb. 4. 1848.

CHAP. XXXVIII.

Greensburg to Philadelphia. — Crossing the Alleghany Mountains. — Scenery. — Absence of Lakes. — Harrisburg. — African Slave-trade. — Railway Meeting at Philadelphia. — Borrowing Money for Public Works. — Negro Episcopal Clergyman. — Washington. — National Fair and Protectionist Doctrines. — Dog-Wood in Virginia. — Excursion with Dr. Wyman. — Natural History. — Musk-rats. — Migration of Humming-birds to New Jersey.

April 19. 1846. — LEFT Greensburg, intending to cross the Alleghany Mountains to Harrisburg, and go thence to Philadelphia. We started in the evening in a large stage coach, in which were nine inside passengers, so that our night journey through Youngstown, Stonytown, and Shellsburg was fatiguing, and not the less so by our having twice to turn out in the dark while all the luggage was shifted to a new vehicle. The last of these broke down, one of the wheels having given way, and we had an opportunity of witnessing the resources and ingenuity displayed on such occasions by American travellers. A large bough of a tree was cut off with an axe, and tied on to the axletree with ropes, so as to support the body of the carriage, and in this way we went several miles without inconvenience. During one of the night transfers of our luggage a carpet-bag of mine was left behind, and when I afterwards missed it at Philadelphia I wrote to three places to claim it. After five days I found it in my room in the hotel, no one knowing whence it came, and nothing having been paid for it. Before reaching Philadelphia it must have been transferred to three distinct conveyances, including two railways. I may state here a fact highly creditable to the public conveyances in the United States, that I never lost a package in either of my tours, although I sent more than thirty boxes of geological specimens from various places, often far south of the Potomac, and west of the Alleghanies; some by canals, some by river steamers, other by coaches or railways. Every one of them sooner or later found their way safely to my house in London.

On leaving Greensburg we crossed one after another of the long parallel ridges of which the Alleghany chain is composed, descending into each of the long intervening valleys, the hills becoming higher and higher as we advanced eastward. The character of the forest changed as we came to higher ground, especially by the intermixture of trees of the fir tribe, and by the undergrowth of azaleas, kalmias, and rhododendrons, for I had seen none of these evergreens since I left Indiana, not even under the oak wood round Greensburg. When day dawned we had reached the highest part of our road, and enjoyed a splendid mountain view, the steep wooded slopes being relieved by the contrast of green meadows bordering the rivers in the bottom of each deep valley, while in many parts of the landscape a picturesque effect was produced by what appeared to be extensive lakes. All who were strangers to the scene required to be assured that they were not really sheets of water; yet they were simply banks of dense white fog resting on the low grounds, which the heat of the sun would soon dissipate. It is singular that there are no lakes in the Appalachian chain, all the rivers escaping from the longitudinal valleys through gorges or cross fissures, which seem invariably to accompany such long flexures of the strata as characterise the Alleghanies or the Jura.

In Campbell's "Gertrude of Wyoming," indeed, we see —

> "Lake after lake interminably gleam,"

amidst the Appalachian ridges; but such characteristics of the scenery of this chain are as pure inventions of the poet's imagination, as the flamingos, palms, and aloes with which he adorns the banks of the Susquehanna.

Near the highest summit of the chain I saw two seams of excellent coal, one of them twelve feet thick, in strata belonging to the same series which I had examined near Greensburg. After descending from the highest level, we followed for a time the windings of the Juniata river, the road often bounded by high rocky cliffs, on the ledges of which we saw the scarlet columbine, blue hepatica, and other wild flowers, in blossom.

We slept at Chambersburg, where, on the roof of the court-house, stands a statue of Franklin, holding a lightning conductor in his hand. A company of firemen were exercising their engines in the great square, throwing up powerful jets of water high enough to wash the statue.

From Chambersburg we went on by railway at the rate of fourteen miles an hour, only slackening our pace when we passed through the middle of towns, such as Shippensburg and Carlisle, where we had the amusement of looking from the cars into the shop windows.

On reaching the Susquehanna we came in sight of Harrisburg, the seat of legislature of Pennsylvania, a cheerful town, which makes a handsome appearance at a distance, with its numerous spires and domes. The railway bridge over the river had been burnt down, and the old bridge carried away by a recent freshet, when large fragments of ice were borne down against the piers.

Among the passengers in the railway to Philadelphia, was an American naval officer, who had just returned from service on the coast of Africa, fully persuaded that the efforts made by the English and United States' fleets to put down the slave-trade, had increased the misery and loss of life of the negroes without tending to check the traffic, which might, he thought, have been nearly put an end to before now, if England and other countries had spent an equally enormous sum of money in forming settlements such as Liberia; although he admitted that negroes from the United States, whose families had been acclimatised in America for several generations, and who settled in Liberia, were cut off by fever almost as rapidly as Europeans.

Returning to Philadelphia, after an absence of six months, we were as much pleased as ever with the air of refinement of the principal streets, and the well-dressed people walking on the neat pavements, under the shade of a double row of green trees, or gazing, in a bright, clear atmosphere, at the tastefully arranged shop windows; nor could we agree with those critics who complain of the prim and quakerish air, and the monotonous sameness, of so regularly built a city.

During our stay, a large meeting was held to promote a sheme for a new railway to Pittsburg, through Harrisburg, the interest of the money to be raised chiefly by city rates. Some of my friends here are opposed to the measure, declaring that such public works are never executed with economy, nor thriftily managed. The taxation always falls on some districts which derive no profit from the enterprise, and they demand other grants of public money as a compensation, and these are laid out with equal extravagance. The good sense of the New Englanders, say they, has almost invariably checked them from entering upon such undertakings, and in one of the few instances in which they have deviated from sound policy they have repented. For when, in opposition to the richer inhabitants, a branch railway was made to connect Bridgeport, in Connecticut, with the main line of road, the bonds of that small inland town were pledged as security for the money borrowed. The traffic proved insufficient to meet their liabilites, and a majority of the citizens then determined to repudiate. The rich alleged that they had opposed the project, and the poor, who had voted away their money, were quite willing that no new taxes should be imposed. The creditors, however, went to law, and, by aid of the courts, compelled payment, as the Supreme Court might have done in the case of the delinquent States (had not the original constitution of the Union been altered before any of them repudiated), which might have given a wholesome check to rash enterprises guaranteed by State bonds.

The booksellers tell me that their trade is injured by the war-panic, and I observe that most of the halfpenny or cent papers are still very belligerent on the Oregon question.

On Sunday I attended service, for the first time, in a free black Episcopal church. Prayers were read well by a negro clergyman, who was evidently an educated man. The congregation consisted wholly of the coloured race. Where there is a liturgy, and where written sermons are read, there is small opportunity of comparing the relative capabilities of Africans and Europeans for the discharge of such functions. In the Baptist, Methodist, and Presbyterian services, the success of the minister depends much more on his individual ability. I was glad, however, to see a negro officiating in a church which confers so much social rank on its clergyman, and in no city more than Philadelphia does the coloured race stand in need of some such make-weights to neutralise the prejudices which retard their natural progress. We were told of an ineffectual attempt, recently made by a lady here, to obtain leave to bury a favourite free negro woman in St. James's graveyard, although she had died a member of the Episcopal church;

nor are any coloured people allowed to be buried at the Laurel Hill Cemetery. That burial-ground commands a beautiful view up and down the Schuylkill, and the ground there is laid out with much taste, being covered with evergreens and trees, and having many of the graves adorned, at this season, with violets and lilies of the valley.

April 27. — Leaving my wife with some friends at Philadelphia, I set out on a geological tour to Richmond, Virginia, to resume my examination of the Oolitic coal-field, left half finished in December last. At Washington I found they were holding a national fair, or grand exhibition of manufactured articles, intended to convince Congress of the advantage of a high tariff. The protectionists maintain that every article which, for seven years, has been shielded from foreign competition, has been reduced in price to the consumer below the foreign cost at the time when the duty was imposed. The free-traders, on the other hand, argue, that their antagonists keep out of sight the fact that in those same seven years the price of the foreign articles might, and probably would, have fallen as much. One party points to the former policy of Great Britain towards her American colonies; how she interdicted them from manufacturing for themselves, and even from selling the productions of their own soil and industry to any but the mother country; — how she grew rich by monopoly and restrictions, nursing her infant agriculture, commerce, and factories, by prohibitive duties; and they ask whether, if the English Cabinet really believed in the theory of free-trade, they would not long ere this have repealed the navigation laws? The advocates of the opposite policy appeal to the recent law for admitting American corn duty-free into England, as demonstrating the sincerity of the British Government. But in this controversy it happens, as usual, that class-interests are espoused with all the personal zeal and energy with which men pursue a private object, while the cause of science, and the general good of the public, being every body's business, are treated with comparative apathy.

When I arrived in Virginia, April 29th, I found the woods everywhere enlivened by the dazzling white flowers, or bracteæ, of the dog-wood (*Cornus florida*), the average height of which somewhat exceeds that of our white thorn; and when, as often happens, there is a back-ground of cedar or pine, the mass of flower is almost as conspicuous as if a shower of snow had fallen upon the boughs. As we sometimes see a pink variety of the wild thorn in England, so there occurs here, now and then, though rarely, a pink dog-wood. Having never remarked this splendid tree in any English shrubbery or park, I had some fine young plants sent home from a nursery to several English friends, and, amongst others, to Sir William Hooker, at Kew, who was not a little diverted at my zeal for the introduction of a tree which had been well established for many years in the British arboretum. But now that I have since seen the dwarfed and shabby representatives of this species in our British shrubberies, I am ready to maintain that it is still unknown in our island. No Virginian, who was not a botanist, could ever recognise it in England as the same plant as the dog-wood of his native land. Yet it is capable of enduring frosts as severe and protracted as are ever experienced in the south of England, and the cause of its flowers not attaining their full size in our climate is probably a want of sufficient intensity of light and heat.

A great variety of oaks were now in leaf in the Virginian forests, among which I observed the white oak, with its leaves in the shape of a violin, and the willow oak, with long and narrow leaves. The ground underneath these trees was adorned with the pink azalea and many other flowers, among the rest the white violet, a species of phlox, and an everlasting *Gnaphalium.*

The cedar (*Juniperus virginiana*) is often covered at this season with what is termed here the cedar apple (*Podisoma macropus*), supposed by many of the inhabitants to be the flower or fruit of the tree itself. It is a beautiful orange-coloured fungus, ornamented with tassels; a very conspicuous object after a shower, but shrinking up if exposed to a day's sunshine.

I made excursions in various directions with my friend, Mr. Gifford, to examine the coal mines north and south of Blackheath, near Richmond, and have already given the results of our observations in the first volume.* I afterwards made an expedition with Dr. Wyman, now Professor of Comparative Anatomy at Cambridge, Massachusetts, to examine the geology of the tertiary strata round Richmond, and those (of the Eocene period) displayed in the cliffs bordering the Potomac river, near Acquia Creek. In one of our walks we saw some dogs feeding on part of the carcass of a horse, and a group of turkey-buzzards eagerly looking on close at hand, but not daring to share in the repast. Near the same spot were the skulls of two dogs lying bleached in the sun, and in the hollow of each we found the nest of a large species of wasp, somewhat resembling our hornet, containing a good store of honey-comb. On the surface of some pools of water I saw floating the singular seed-vessel of the nuphar, or yellow pond lily (*Nelumbium*). These seeds have been known to vegetate after they have been kept for a hundred years.

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* Vol. I. p. 279.

In passing through a wood near Acquia Creek, on a hot day, we came upon a large snake, about four feet long, resembling that called the moccassin, which lifted itself up, folding its body into several graceful coils, and then darted its head and neck forward at a dog which had followed us from the inn. The dog dexterously retreated as often as a blow was aimed at him, barking loudly, and enjoying the mock fight. The extremity of the snake's tail, although not armed with a rattle, was in a state of constant vibration.

On a soft sandy road we saw a great many of the ball-rolling beetles (*Ateuchus volvens*), which resemble in form the *Scarabæus sacer* of Egypt. They were all busily engaged in pushing along round balls of dung, in the centre of some of which we found an egg, and in others a maggot. A pair of beetles was occupied with each globular mass, which considerably exceeded themselves in size. One of them went before, and usually climbed up the side of the ball till the weight of its body made the mass fall over; the other pushing behind, so as to urge it forwards, or at least prevent it from rolling back again. We saw two of them in half a minute force a ball for a distance of eighteen inches up a gentle slope, and when they reached a soft part of the road, one of them began to excavate a hole, and soon entirely disappeared under ground, heaving up the earth till it cracked and opened wide enough to allow his companion to push the ball of dung into it. The round mass immediately began to sink, and in a few minutes was out of sight. We saw another pair try in vain to bury their treasure, for they had selected a spot where the soil was too hard; at last they gave up the attempt, and, rolling it away, set out in search of a more favourable spot.

We crossed several ploughed fields on the slope of the hills which descend towards the Potomac, where a singular kind of manure is used, consisting of dead fish, and almost exclusively of the bony pike, or garfish (*Lepidosteus oxyurus*). The hard stony scales resist decomposition for several years. The fishermen told us that they are greatly annoyed by constantly taking these pikes in their nets with the herrings. There is so enormous an abundance of herrings in some spots in this estuary, that 50,000 have sometimes been taken this season in a few hours.

In a marsh near the inn, we observed numerous habitations of the musk-rat, standing up like haycocks. When the small size of the animal is considered, the quantity of dried grass, reeds, and rushes accumulated in one of these hummocks, at least a cart-load, is surprising. We waded through the water to one of them, and found that it was four feet high, and nine feet in diameter. When we pulled it to pieces, the smell of musk was very perceptible. At the depth of about sixteen inches from the top we found a cavity or chamber, and a small gallery leading from it to another chamber below, from which a second gallery descended, and then went upwards again to a third chamber, from all which there was a perpendicular passage, leading down to below the level of the water, so that the rats can dive, and, without being seen again, enter their apartments, in which they breathe air.

The unio, or freshwater mussel, is a favourite food of these rats, and they often leave the shells on the banks of the American rivers, with one valve entire and the other broken. In the evening the note of the bull-frog, in these swamps, reminded me much of the twanging of a large Jew's-harp.

From Acquia Creek, I went, by steamer, to Washington, and thence by railway through Philadelphia, to the town of Burlington, in New Jersey, beautifully situated on the banks of the Delaware. Here I paid a short visit to my friend, Mr. William M'Ilvaine, and crossed the Delaware with him to Bristol, to renew my acquaintance with Mr. Vanuxem, a geologist of no ordinary merit. His death, which happened soon afterwards, was a loss to the public as well as to many personal friends.

In Wilson's "Ornithology" it is stated, that the humming-bird migrates from the South to Pennsylvania the latter part of April, and builds its nest there about the midle of May. For the last thirty years, Mr. M'Ilvaine had never been disappointed in seeing it reach Burlington the first week of that month, generally about the middle of the week, its northward progress being apparently hastened or retarded by the mildness or inclemency of the season. They seem always to wait for the flowering of a species of horse-chestnut, called here the buck-eye, from the fancied likeness of its fruit to the eye of a deer. The bright-red blossoms of this tree supply the nourishment most attractive to these birds, whose arrival had been looked for the very day after I came. Strange to say, one of them, the avant-courier of the feathered host, actually appeared; and next morning, May 7th, hundreds were seen and heard flitting and humming over the trees. A lady sent us word that a straggler from the camp was imprisoned in her greenhouse, and, going there, I saw it poised in the air, sucking honey from the blossom of an orange-tree. The flower was evidently bent down slightly, as if the bird rested its bill upon it to aid its wings in supporting its body in the air, or to steady it. When it wished to go out, it went straight to the window at which it had entered, and, finding it closed, flew rapidly round the large conservatory, examining all parts of it, without once striking the glass or beating its wings against the wall, as the more timid of the feathered tribe are apt to do. No sooner, however, was a small casement opened, than it darted through it like an arrow.

CHAP. XXXIX.

New York, clear Atmosphere and gay Dresses. — Omnibuses. — Naming of Streets. — Visit to Audubon. — Croton Aqueduct. — Harper's Printing Establishment. — Large Sale of Works by English and American Authors. — Cheapness of Books. — International Copyright.—Sale of Eugène Sue's "Wandering Jew."—Tendency of the Work.—Mr. Gallatin on Indian Corn. — War with Mexico. — Facility of raising Troops. — Dr. Dewey preaching against War. — Cause of Influence of Unitarians. — Geological Excursion to Albany.—Helderberg War. — Voting Thanks to the Third House. — Place-hunting. — Spring Flowers. — Geology and Taconic System.

May 7. 1846. — ON our return to New York, we were struck with the brightness of the atmosphere in spring, arising not merely from the absence of smoke, but from the quantity of solar light, as compared to England, this city being in the same latitude as Naples. The unsullied purity of the air makes gay and brilliant colours in dress and furniture appropriate.

Every fortnight the "Journal des Modes" is received from France, and the ladies conform strictly to the Parisian costume. Except at balls and large parties, they wear high dresses, and, as usual in mercantile communities, spare no expense. Embroidered muslin, of the finest and costliest kind, is much worn; and my wife learnt that sixteen guineas were not unfrequently given for a single pocket-handkerchief.

Extravagantly expensive fans, with ruby or emerald pins, are also common. I had heard it said in France that no orders sent to Lyons for the furnishing of private mansions, are on so grand a scale as some of those received from New York; and I can well believe it, for we saw many houses gorgeously fitted up with satin and velvet draperies, rich Axminster carpets, marble and inlaid tables, and large looking-glasses, the style in general being Parisian rather than English. It was much more rare here than at Boston to see a library forming part of a suite of reception-rooms, or even a single bookcase in a drawing-room; nor are pictures so common here.

In the five months since we were last in this metropolis, whole streets had been built, and several squares finished in the northern or fashionable end of the town, to which the merchants are now resorting, leaving the business end, near the Battery, where they formerly lived. Hence there is a constant increase of omnibuses passing through Broadway, and other streets running north and south. Groups of twelve of these vehicles may be seen at once, each with a single driver, for wages are too high to support a cad. Each omnibus has an opening in the roof, through which the money is paid to the coachman. We observed, as one woman after another got out, any man sitting near the door, though a stranger, would jump down to hand her out, and, if it was raining, would hold an umbrella over her, frequently offering, in that case, to escort her to a shop; attentions which are commonly accepted and received by the women as matters of course.

All the streets which cross Broadway run east and west, and are numbered, so that they have now arrived at 146th Street — a mode of designating the different parts of a metropolis worthy of imitation on both sides of the Atlantic, since experience has now proved that there is, in the Anglo-Saxon mind, an inherent poverty of invention in matters of nomenclature. For want of some municipal regulations like those of New York, the same names are indefinitely multiplied in every great city; and letters, after wandering over all the streets bearing the same appellation, to the infinite inconvenience and cost of the post-office, are at length received, if haply they ever reach their destination, long after they are due.

The low island on which New York is built, is composed of granite and gneiss covered with "drift" and boulders. The original surface being very uneven, the municipality has fixed upon a certain grade or level to which all heights must be lowered by blasting the rocks or by carting away gravel, and up to which all the cavities must be raised. Besides other advantages of this levelling process, the ground is said to become more healthy and free from malaria, there being no longer any stagnant pools of water standing in the hollows.

May 10. — Paid a visit to Mr. Audubon, the celebrated ornithologist, at his delightful residence on the banks of the Hudson, north of Bloomingdale. His son had just returned from Texas, where he had been studying the natural history of that country, especially the mammalia, and was disappointed at the few opportunities he had enjoyed of seeing the wild land quadrupeds in a state of activity, so as to observe their habits. I told him I had been equally surprised at the apparent scarcity of this tribe in the native forests of the United States. This whole class of animals, he said, ought to be regarded as properly nocturnal; for not merely the feline tribe and the foxes, the weasels and bats, shun the daylight, but many others feed partly by night, most of the squirrels and bears for example. The ruminants no doubt are an exception, yet even the deer and the buffalo, like the wild horse, travel chiefly in the night.

From Mr. Audubon's I went to Highbridge, where the Croton water is made to play for the amusement of visitors, and is thrown up in a column to the height of 120 feet.

I went also to see the reservoir, enclosing an area of no less than thirty-six acres, from which the water is distributed to all parts of New York. In this artificial lake all the river sediment is deposited, the basin being divided into two parts, so that one may be cleaned out while the other is in use. The tunnel or pipe conveying the water for a distance of more than thirty miles, from the source to the Haerlem river, is so large, that the chief engineer and commissioners of the works were able to float down it in a flat-bottomed boat when it was first opened, in July, 1842.

While at New York, we were taken by our literary friend, Mr. Cogswell, over the printing and publishing establishment of the Harpers, the largest in America, and only surpassed, in the scale of its operations, by two or three in Great Britain. They give employment to three hundred men, manufacture their own types and paper, and have a "bookbindery" under the same roof; for, in order to get out, with the utmost despatch, the reprints of foreign works not entitled to copyright, they require to be independent of all aid from other traders. We were shown a fireproof vault, in which stereotype plates, valued at about 300,000 dollars, are deposited. In one of the upper stories a long line of steam-presses was throwing off sheets of various works, and the greater number were occupied with the printing of a large illustrated Bible, and Morse's Geography for the use of schools. In 1845, the Harpers sold two millions of volumes, some of them, it is true, being only styled numbers, but these often contain a reprint of an entire English novel, originally published in two or three volumes, at the cost of a guinea and a half, the same being sold here for one or two shillings. Several of Bulwer's tales are among these, 40,000 copies of his "Last of the Barons" having just issued from this house. It may, indeed, be strictly said of English writers in general, that they are better known in America than in Europe.

Of the best English works of fiction, published at thirty-one shillings in England, and for about sixpence here, it is estimated that about ten times as many copies are sold in the United States as in Great Britain; nor need we wonder at this, when we consider that day labourers in an American village often purchase a novel by Scott, Bulwer, or Dickens, or a popular history, such as Alison's Europe (published at thirteen pounds in England and sixteen shillings in America), and read it at spare moments, while persons in a much higher station in England are debarred from a similar intellectual treat by considerations of economy.

It might have been apprehended that, where a daily newspaper can be bought for a halfpenny, and a novel for sixpence, the public mind would be so taken up with politics and light reading, that no time would be left for the study of history, divinity, and the graver periodical literature. But, on the contrary, experience has proved that, when the habit and facility of reading has been acquired by the perusal even of trashy writings, there is a steady increase in the number of those who enter on deeper subjects. I was glad to hear that, in proportion as the reading public augments annually, the quality of the books read is decidedly improving. About four years ago, 40,000 copies were printed of the ordinary common-place novels published in England, of which sort they now only sell about 8000.

It might also have been feared that the cheapness of foreign works unprotected by copyright, would have made it impossible for native authors to obtain a price capable of remunerating them highly, as well as their publishers. But such is not the case. Very large editions of Prescott's "Ferdinand and Isabella," and of his "Mexico," and "Peru," have been sold at a high price; and when Mr. Harper stated to me his estimate of the original value of the copyright of these popular works, it appeared to me that an English author could hardly have obtained as much in his own country.* The comparative cheapness of American books, the best editions of which are by no means in small print, seems at first unintelligible, when we consider the dearness of labour, which enters so largely into the price of printing, paper, and binding. But, first, the number of readers, thanks to the free-schools, is prodigiously great, and always augmenting in a higher ratio even than the population; and, secondly, there is a fixed determination on the part of the people at large to endure any taxation, rather than that which would place books and newspapers beyond their reach. Several politicians declared to me that not only an income tax, but a window tax, would be preferred; and "this last," said they, "would scarcely shut out the light from a greater number of individuals." The duty on paper, in the United States, is trifling, when compared to that paid in Great Britain. Mr. Chambers informs us, that the Government duty of 5000*l.*, paid by him for his Miscellany, in twenty volumes, was equal in amount to the whole profits of that publication. The cost of advertisements, in America, is also small. One of my American friends sent over to a London publisher 250 copies of his work, charging him 4*s.* 6*d.* each. After paying entrance duties, and necessary outlay for advertisements in London, and the agency, it was found that the price must be as high as 16*s.*

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* A letter, dated April 15. 1849, was lately shown me from the Harpers, with permission to make known its contents, in which they mentioned, that having been authorised by Mr. Macaulay to publish in America his "History of England," they had printed six editions at various prices varying from four dollars to fifty cents (sixteen shillings and sixpence to two shillings). At the expiration of the first three months, they had sold 40,000 copies, and other booksellers who had issued independent editions had sold about 20,000; so that 60 000 copies had been purchased in the United States at a time when about 13,000 had been disposed of by Longman and Co., in London, at the price of 1*l.* 12*s.* each. As the cheap American editions were only just brought into the market at the date of this letter, the principal sale of the book was but commencing.

The party who are in favour of an international copyright between England and the United States, seems to be steadily gaining strength among the booksellers, publishers, and authors, although the editors of newspapers and their readers may perhaps oppose the measure for some time. The number of reprisals now made by English speculators are very numerous. According to a statement lately presented to Congress by Mr. Jay, of New York, there are about 600 original American works "pirated" in Great Britain; or, to speak more correctly, while the law remains in its present state, reprinted without leave of their American authors, or any pecuniary acknowledgment to them.

Many are of opinion that the small print of cheap editions in the United States, will seriously injure the eyesight of the rising generation, especially as they often read in railway cars, devouring whole novels, printed in newspapers, in very inferior type. Mr. Everett, speaking of this literature, in an address to the students of Harvard College, said, "If cheap it can be called, which begins by costing a man his eyes, and ends by perverting his taste and morals."

As an illustration of the mischievous tendency of the indiscriminate reading of popular works by the multitude, when the higher classes and clergy can exert little or no control in the selection of the books read, the wonderful success of Eugène Sue's "Wandering Jew" was pointed out to me by many, with no small concern. This led me to ask Mr. Harper how many copies he had disposed of, and he answered, "80,000, issued in different shapes, and at various prices." It had so often been thrust into my hands in railway cars, and so much talked of, that, in the course of my journey, I began to read it in self-defence; and, having begun, could not stop till I had finished the whole, although the style of the original loses half its charms in an imperfect translation. "Le vieux dragon," for example, is always rendered the "old dragon," instead of "dragoon," and the poetry of a brilliant passage is nearly destroyed by "défense" being translated "defence," instead of "barrier," with other blunders equally unpardonable. Yet the fascination of the original, and its power to fix the attention, triumph over these disadvantages and over the violence done to probability in the general plot, and over the extravagance of many of its details. The gross, sensual, and often licentious descriptions in which the author indulges in some scenes, and still more, such sentimental immorality as is involved in the sympathy demanded for Hardy's love and intrigue with a married woman (he being represented as the model of a high-minded philanthropist), make one feel the contrast of such a work with the chaste and pure effusions of Scott's genius. Yet there is much pure feeling, many touches of tenderness in the tale, and many passages fitted to awaken our best affections. Even the false political economy bordering on communism, is redeemed by the tendency of the book to excite sympathy for the sufferings, destitution, and mental degradation of the poor. The dramatic power displayed in many scenes, is of a high order; as when the Jesuit Rodin, receiving his credentials from Rome, is suddenly converted into the superior of the haughty chief to whom he had been previously the humble secretary, and where Dagobert's wife, under the direction of her confessor, refuses, in opposition to a husband whom she loves and respects, to betray the place of concealment of two young orphans, the victims of a vile conspiracy. In this part of the narrative, moreover, the beauty of the devotional character of the female mind is done full justice to, while the evils of priestly domination are exhibited in their true colours. The imprisonment of a young girl, of strong mind and superior understanding, in a madhouse, until she is worked upon almost to doubt her own sanity, are described with much delicacy of feeling and pathos, and make the reader shudder at the facility with which such institutions, if not subject to public inspection, may be, and have been abused.

The great moral and object of the whole piece, is to expose the worldly ambition of the Romanist clergy, especially of the Jesuits, and the injury done, not only to the intellectual progress of society at large, but to the peace and happiness of private families, by their perpetual meddling with domestic concerns.

That the shafts of this satire have not missed their aim, has been proved, among other evidences, by its having been thought politic, even in England, to circulate, chiefly, it is said, among the Irish Catholics, an "Adaptation of the Wandering Jew, from the original of Eugène Sue." In this singular re-cast of the French romance, which I have perused, the Russian police is everywhere substituted for the Jesuits, and Rodin becomes the tool of the Czar, intriguing in French politics, instead of the servant of the successor of Ignatius Loyola. On the whole, I am inclined to believe that the good preponderates over the evil, in the influence exerted on the million, even by such a romance. It has a refining rather than a corrupting effect, and may lead on to the study of works of a more exalting character. The great step is gained, when the powers of the imagination have been stimulated and the dormant and apathetic mind awakened and lifted above the prosaic monotony of every-day life.

May 9. — Called with a letter of introduction on Mr. Gallatin, well known by a long and distinguished career in political life. As a diplomatist in London, he negotiated the original Oregon treaty with Great Britain, and has now, at the age of eighty-two, come out with several able and spirited pamphlets, to demonstrate to his countrymen that their national honour would not be compromised by accepting the terms offered by the British Cabinet. Being at the same time an experienced financier, he has told them plainly, if they will go to war, how much it will cost them annually, and what taxes they should make up their minds to submit to cheerfully, if they would carry on a campaign with honour and spirit against such an enemy.

In the course of conversation, I found that Mr. Gallatin was of opinion that the indigenous civilisation of several Indian tribes, and of the Mexicans and Peruvians among others, was mainly due to the possession of a grain so productive, and, when dried in the sun, so easily kept for many years, as the maize or Indian corn. The potato, which, when healthy, can rarely be stored up and preserved till the next harvest, may be said, on the contrary, to be a food on which none but an improvident race would lean for support. "I have long been convinced," said Mr. Gallatin, "that the Indian corn has also given a powerful impulse to the rapid settlement of the whites in Ohio, Indiana, Illinois, and other western States. In one of my first excursions to the West, I saw a man felling trees in March, who, when I returned in October, had harvested a crop of Indian corn, grown on the very spot. He had also the leaves and stems of the plant to serve for winter fodder for his cattle. He was an emigrant, newly arrived, and entirely without the capital indispensable to enable him to cultivate wheat, which must have been twelve or thirteen months in the ground before it could be reaped."

Next day the stirring news of the invasion of the Mexican territory by the American army, reached New York, and I met the news-boys, in every street, crying out, "War with Mexico!" Soon afterwards I saw the walls covered with placards, headed with the words, "Ho, for the halls of the Montezumas!"

The mayor had called a public meeting to express sympathy with the President and the war-party at Washington. This meeting was held in the Park, and although it may have served the purpose of the democratic party, it was certainly a signal failure, if any strong expression of popular feeling in favour of such a war was looked for. In the crowd I heard nothing but Irish, Scotch, and German accents, and the only hearty cheer which any one orator could draw, even from this mob of foreigners, was obtained by representing the Mexicans as acting under the influence of British gold.

I met with no one person in society who defended the aggression on the Mexican territory; but as they cannot prevent it, they endeavour, each in his way, to comfort themselves that the mischief is no worse, some saying, it will be a less evil than fighting with Great Britain, others that it will furnish employment for a host of turbulent spirits; while some merchants hint that the democratic party, had they been economical, might have lowered the tariff, and carried out their dangerous theory of free-trade, whereas now they will plunge the nation into debt, and be compelled to resort to high duties, which will "protect native industry." The dissatisfaction of others is unbounded; they dread the annexation of a region containing five millions of Indians, which, say they, will deteriorate the general standard of the white population; — they deplore the development of a love for military glory, a passion inconsistent with all true republican principles; — and one friend observed to me, "You will soon see a successful soldier, wholly unknown to all of us at this moment, a man unversed in civil affairs, raised to the Presidentship." I asked whether, in a country where nearly all are industriously employed, it will be possible to find recruits for foreign service. Nothing, they reply, is more easy. "Our broad Indian frontier has nurtured a daring and restless population, which loves excitement and adventure, and in the Southern States there are numbers of whites to whom military service would be a boon because slavery has degraded labour." A week later I received a letter from a correspondent in the South, who said, "Such is the military fever in Arkansas, Louisiana, Alabama, and Mississippi, that these States alone would furnish 50,000 men, if required; and in many districts we are in fear of such an enlistment of the white population, that there will be too few left at home to serve as a police for the negroes. Married men are going as well as bachelors, lawyers, medical men, and schoolmasters, many of whom have no taste whatever for fighting or foreign service, but they know that to have served a year in a campaign, to have been in a battle, or to have been wounded, would advance them more in an election, or even in their several professions, than any amount of study or acquired knowledge.

The Sunday following we heard a sermon by the Rev. Orville Dewey, in which this spirit of territorial aggrandisement, this passion for war, these false notions of national honour and glory, were characterised as unchristian, and indicating a low standard of private as well as public morality. I remarked to a New England acquaintance, who was one of the large congregation, that whatever might be said against the voluntary system, the pulpit in America seemed to me more independent than the press. "Because every newspaper," he replied, "is supported by half yearly or annual subscribers, and no editor dares write against the popular sentiment. He knows that a dagger is always suspended over him by a thread, and if he presumed to run counter to the current, his table would be covered next morning with letters each beginning with the dreaded words, 'Stop my paper.' He has made a bargain like that of Doctor Faustus with the devil, bartering away his immortal soul for a few thousand dollars." When I afterwards reflected on this alleged tyranny of regular subscribers, it occurred to me that the evil must be in a great degree mitigated by the cheapness and variety of daily prints, each the organ of some distinct party or shade of opinion, and great numbers of them freely taken in at every reading-room and every hotel.

I might say of Dr. Dewey's discourse, as I have already said of the preaching of the Unitarians generally, that, without wanting spirituality, it was more practical and less doctrinal than the majority of sermons to which I have been accustomed to listen. But I should mislead my readers if I gave them to understand that they could frequent churches of this denomination without risk of sometimes having their feelings offended by hearing doctrines they have been taught to reverence treated slightingly, or even with contempt. On one occasion (and it was the only one in my experience), I was taken, when at Boston, to hear an eminent Unitarian preacher who was prevented by illness from officiating, and his place was supplied by a self-satisfied young man, who, having talked dogmatically on points contested by many a rationalist, made it clear that he commiserated the weak minds of those who adhered to articles of faith rejected by his church. If this too common method of treating theological subjects be ill calculated to convince or conciliate dissentients, it is equally reprehensible from its tendency to engender, in the minds of those who assent, a Pharisaical feeling of self-gratulation that they are not as other sectarians are.

I can only account for the power which the Unitarians have exerted, and are now exerting, in forwarding the great educational movement in America, in the face of that almost superstitious prejudice with which their theology is regarded by nineteen-twentieths of the population, by attributing it to the love of intellectual progress which animates both their clergy and laity, and the deep conviction they are known to feel that public morality and happiness can only be ensured by spreading an elevated standard of popular education throughout the masses. In their enthusiastic pursuit of this great end, they are acknowledged to have no thought of making proselytes to any system of religious doctrines, and are therefore trusted in the management of schools by the parents of children of the most opposite persuasions. In regard to their own faith, some misapprehension has arisen in consequence of the name they bear, which was not chosen by themselves, but to which, on the contrary, they have objections such as members of the Anglican Church might feel if some such name as Anti-transubstantiationists, or any term which simply expressed their opposition to some one article of the Romanist creed, had been fixed upon them. When the rigid Calvinism of the old Puritans caused a schism in New England, the seceders wished to free themselves from the fetters of a creed, and to take the Gospel alone as their standard of faith. They were naturally, therefore, averse to accept a name which might be generally supposed to imply that they attached a prominent importance to the negation of any one doctrine professed by other Christians. "I desire," said Channing, "to wear the livery of no party; but we accept the appellation which others have imposed upon us, because it expresses what we believe to be a truth, and therefore we ought not to shrink from the reproaches cast upon it. But, had the name been more honoured, had no popular cry been raised against it, I would gladly have thrown it off."*

May 11. — Sailed from New York to Albany in a steamer, which carried me at the rate of eighteen miles an hour through the beautiful scenery of the Hudson river. I had been invited by two of the State surveyors of New York to make an excursion with them to the North of Albany, and to discuss in the field some controverted points respecting the geology of the oldest fossiliferous strata. There was a physician on board, who, having been settled for twenty-six years in Virginia, had now come back, after that long absnece, to see his native State. His admiration and wonder at the progress made by New York in a quarter of a century were unbounded.

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* Channing's Works, vol. iii. p. 210.

Speaking of his adopted country, he exclaimed, "We have been left far behind in the race." I suggested, that if, twenty-six years ago, a period had been fixed upon by law for the emancipation of their slaves, Virginia might, ere this, have been relieved of nearly all her negro population, so great has been the migration of negroes to the South. "It is useless," he said, "to discuss the practicability of such a measure, while the majority of our legislators, having been born slave-holders, are not convinced of its desirability." While my companion was absorbed in admiration at the improvement of "the Empire State," my thoughts and feelings took a very different turn, when I learned that "the Helderberg war," which I have alluded to in my former "Travels,"* is still going on, and seems as far from a termination as ever. The agricultural population throughout many populous counties have now been in arms for eight years, to resist the payment of rents due to their landlords, in spite of the decisions of the courts of law against them. Large contributions have been made towards an insurrectionary fund,—one of its objects being to support a newspaper, edited by a Chartist refugee from England, in which the most dangerous anti-social doctrines are promulgated. The "anti-renters" have not only set the whole militia of the State at defiance, in more than one campaign, but have actually killed a sheriff's officer, who was distraining for rent! If any thing could add to the disgrace which such proceedings reflect on the political administration of affairs in New York, it is the fact that the insurgents would probably have succumbed ere this, had they not been buoyed up by hopes of legislative interference in their favour, held out to them by popularity-hunting candidates for the governorship, and other official places.

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* Vol. i. p. 68.

In the newspapers of the day, a scene described as having occurred at the close of the Legislative Session in Albany excited my curiosity. One of the members of the House of Representatives moved a vote of thanks "to the gentlemen of the third house for the regularity of their attendance and the courtesy with which they had conducted themselves." The motion was seconded, read from the chair amidst great laughter, and then allowed to drop. I inquired what might be the meaning of this joke, and was asked in reply whether I had read the letters of Jesse Hoyt and others, edited by Mackenzie? I had, indeed, purchased the pamphlet alluded to, containing a selection from an immense mass (said to amount to twenty-five volumes) of the private and confidential correspondence of official men, left accidentally by them, on a change of administration, in the custom-house of New York. All these had been printed for the benefit of the public by their successors. The authenticity of the documents made known by this gentlemanlike stroke of party tactics, purporting to be penned by men who had filled high places in the State and Federal Governments, had been placed beyond a doubt; for the writers had attempted to obtain an injunction in the law courts to stop the publication, claiming the copyright of letters which they had written. Some time before this conversation, a merchant of Boston, who wished me to look only on the bright side of their institutions, and who was himself an optimist, had said to me, "Our politicians work in a glass hive, so that you always see the worst of them; whereas your public men can throw a decent veil of secrecy over much that may be selfish and sordid in the motives of their conduct. Hence the scandal of your court and cabinets is only divulged to posterity, a hundred years after the events, in private memoirs." Unfortunately for this theory, a glance at the Mackenzie letters was enough to teach me, that, if the American bees work in a glass hive, the glass is not quite so transparent as my friend would have led me to believe. The explanation of the satirical motion made in the house at Albany, then proceeded thus: "The patronage of the State of New York is enormous; the Governor alone has the appointment of two hundred and sixty civil officers, and the nomination of more than two thousand places is vested jointly in him and the senate. Some of these are for two, others for five years, and they are worth from two hundred to five thousand dollars a-year. Among the posts most coveted, because the gains are sometimes very high, though fluctuating, are those of the inspectors, who set their mark or brand on barrels of exported goods, such as flour, tobacco, preserved pork, mackarel and other fish, to guarantee their good quality, and guard the public against imposition, in cases where the articles would be injured if opened and examined by the purchaser. It is scarcely necessary to state, that where the prey is so abundant, there will the eagles be gathered together; and besides the aspirants to vacant offices, there is a crowd of lawyers and paid agents of private individuals and companies, who have to watch the passage of private and public bills through the Legislature. During the whole session, they fill the Governor's ante-room and the lobby of each House; and, as they are equal in respectability, number, station, and influence, to the two other houses put together, besides that they spend, perhaps, more money in Albany, we dignify them with the name of 'the third house.'"

"Are they," said I, "suspected of giving money-bribes to legislators?" "No; but they may convey a party of representatives on a railway trip, to make them acquainted with the merits of some case relating to a canal or railroad, and then entertain them with a dinner before they return." "In Massachusetts," said I, "people speak with more respect of their assembly." "No doubt, for in that State there is much less to give away, and therefore less corruption and intrigue. Besides, we have only 160 senators and representatives, whereas the assembly at Boston is far more numerous, so that it is not so easy to bring the influence of 'the third house' to bear upon it."

In the public museum at Albany, Dr. Emmons showed me a fine collection of simple minerals, rocks, and fossils, made by himself and other geologists to whom the State survey was entrusted. He then accompanied me across the Hudson river, to examine the slate and limestone eastward of Albany. Here, from the summit of Greenbush Hill, we enjoyed a magnificent view of the Catskill Mountains, and the Helderberg range in the distance. In the foreground was the river, and Albany itself, now containing a population of 40,000 inhabitants, with its domes and spires clustered together, in the higher parts of the city, and lighted up by a bright sunshine.

The day following, Dr. Emmons and Mr. James Hall went with me to explore the chain of the Bald Mountains, north of Galeville. We passed through the gay town of Saratoga Springs, where the mineral waters burst out from "the Lower Silurian," or most ancient fossiliferous rocks. We saw many picturesque spots, especially the waterfall called Baaten Kill, near Galeville, but no grand or striking scenery. Among the plants in blossom, we gathered *Anemone nemorosa, Trientalis Americana* (less beautiful than our British *Trientalis Europæa*), *Cypripedium pubescens, Geranium sylvaticum,* three species of violet (all without scent), *Houstonia cœrulea, Gnaphalium plantaginifolium,* and in several copses the beautiful *Polygala pauciflora,* which might be truly said —

> "To purple all the ground with vernal flowers."

Whether, in this part of the United States, there are any *fossiliferous* rocks older than the Lower Silurian, was the geological point at issue; and the question resembled one on which an animated controversy had lately been carried on in Great Britain, in regard to the relative age of the "Cambrian" and "Silurian" groups. As those strata, called Cambrian, which contained organic remains, were found to be nothing more than highly disturbed and semi-crystalline Silurian rocks, so I believe the formations called Taconic, in the United States, to have claim to no higher antiquity, and to be simply Silurian strata much altered, and often quite metamorphic.

CHAP. XL.

Construction and Management of Railways in America. — Journey by Long Island from New York to Boston. — Whale Fishery in the Pacific.— Chewing Tobacco.— Visit to Wenham Lake. — Cause of the superior Permanence of Wenham Lake Ice. — Return to Boston. — Skeletons of Fossil Mastodons. — Food of those extinct Quadrupeds. — Anti-war Demonstration. — Voyage to Halifax. — Dense Fog. — Large Group of Icebergs seen on the Ocean.—Transportation of Rocks by Icebergs. — Danger of fast Sailing among Bergs. — Aurora Borealis. — Connection of this Phenomenon with drift Ice. — Pilot with English Newspapers. — Return to Liverpool.

May 21. 1846.—IN the construction and management of railways, the Americans have in general displayed more prudence and economy than could have been expected, where a people of such sanguine temperament were entering on so novel a career of enterprise. Annual dividends of seven or eight per cent. have been returned for a large part of the capital laid out on the New England railways, and on many others in the Northern States. The cost of passing the original bills through the State parliaments has usually been very moderate, and never exorbitant; the lines have been carried as much as possible through districts where land was cheap; a single line only laid down where the traffic did not justify two; high gradients resorted to, rather than incur the expense of deep cuttings; tunnels entirely avoided;

very little money spent in building station-houses; and, except where the population was large, they have been content with the speed of fourteen or sixteen miles an hour. It has, moreover, been an invariable maxim "to go for numbers," by lowering the fares so as to bring them within the reach of all classes. Occasionally, when the intercourse between two rich and populous cities, like New York and Boston, has excited the eager competition of rival companies, they have accelerated the speed far beyond the usual average; and we were carried from one metropolis to the other, a distance of 239 miles, at the rate of thirty miles an hour, in a commodious, lofty, and well-ventilated car, the charge being only three dollars, or thirteen shillings. We went by a route newly opened, first through Long Island, ninety-five miles in length, over a low, level tract, chiefly composed of fine sand, and we then found a steamer ready to take us across the Sound to New London in Connecticut, where we were met by the cars at Point Allen; after which we enjoyed much delightful scenery, the railway following the margin of a river, where there were cascades and rapids foaming over granite rocks, and overhung with trees, whose foliage, just unfolded, was illumined by a brilliant sunshine.

In the estuary of New London we saw many large whalers, and a merchant talked to me with satisfaction of the success of the United States' whale-fishery in the Pacific, saying it amounted to 200,000 tons, while that of Great Britain did not exceed 60,000. "Five fish," said he, "is the usual cargo of an English whaler, in the northern and Greenland fishery, as being unable to winter out, they boil the blubber at home; whereas the Americans boil it in a huge cauldron on deck, and after staying out three years, return with the oil of ninety whales in one ship. Our fishery in the Pacific is becoming a most important nursery for seamen, giving occupation to about 20,000 men, which would enable us at any moment to man a powerful fleet. The possession of California is therefore much coveted by us, because the port of San Francisco is the only one in the Northern Pacific not exposed to the west wind, or blocked up by a bar of sand, such as that which renders the mouth of the Columbia river impassable to large ships. It is not territory but a sea-port we need, and this advantage a war with Mexico may give us."

There was besides much characteristic conversation in the cars, about constructing a railway 4000 miles long from Washington to the Columbia river; and some of the passengers were speculating on the hope of seeing in their life-time a population of 150,000 souls settled in Oregon and California. A variety of plans was also freely discussed for crossing the isthmus from the Gulf of Mexico into the Pacific, so as to avoid the long and dangerous voyage round Cape Horn. A ship-canal across the isthmus of Tehuantepec, 135 miles in length, was alluded to as the favourite scheme; and the expediency of forcing Mexico to cede a right of way was spoken of as if the success of their campaign was certain.

It is the fashion for travellers in the New World to dwell so much on the chewing of tobacco, that I may naturally be expected to say something of this practice. There is enough of it to be very annoying in steam-boats and railway-cars, but far less so as we journey northwards; and I never saw, even in the South, any chewing of the weed in drawing-rooms, although we were told in South Carolina that some old gentlemen still indulged in this habit. That it is comparatively rare in the New England States, was attested by an anecdote related to me of a captain who commands one of the steamers on Lake Champlain, who prided himself on the whiteness of his deck, intended to be kept as a promenade. Observing a Southerner occasionally polluting its clean floor, he ordered a boy to follow him up and down with a swab, to the infinite diversion of the passengers, and the no small indignation of the Southerner, when at length he discovered how his footsteps had been dodged. The governor of a Penitentiary told me, that to deprive prisoners of tobacco was found to be a very efficient punishment, and that its use was prohibited in the New England madhouses, as being too exciting.

From Boston we went to Ipswich, Massachusetts, to visit Mr. Oakes, the botanist, with whom we had spent many pleasant days in the White Mountains.* He set out with us on an excursion to Wenham Lake, from which so much ice is annually exported to England and other parts of the world.

This lake lies about twenty miles to the north-east of Boston. It has a small island in the middle of it, is about a mile long and forty feet deep, and is surrounded by hills of sand and gravel, from forty to a hundred feet high. The water is always clear and pure, and the bottom covered with white quartzose sand. It is fed by springs, and receives no mud from any stream flowing into it; but at the lower extremity a small brook of transparent water flows out. In some parts, however, there must, I presume, be a soft and muddy bottom, as it is inhabited by eels, as well as by pickerell and perch. Mr. Oakes had recently received a present of a snapping turtle, weighing 25 lbs., taken from the lake. The ice is conveyed by railway to Boston to be shipped, and the increase of business has of late been such as to cause the erection of new buildings, measuring 127 feet by 120, and 24 feet high. They stand on the water's edge, by the side of the old storehouses, which are very extensive, built of wood, with double walls two feet apart, the space between being filled with sawdust, which excludes the external air; while tan is heaped up, for the same purpose, on the outside. The work of cutting and storing the ice is carried on in winter, and is not commenced till the ice is at least a foot thick. The surface is always carefully swept and kept free from snow; and as none but the most compact and solid ice is fit for the market, it is necessary to shave off three inches or more of the superficial ice, by means of a machine called an ice-plane, drawn by a horse. This operation is especially required after a thaw or a fall of rain, succeeded by a frost, which causes the lake to be covered with opake, porous ice.

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* See Vol. I. p. 71.

Sir Francis Head, in his "Emigrant," 1846, has attributed the durability of the Wenham Lake ice, or its power of resisting liquefaction, to the intense cold of a North American winter. It is perfectly true that this ice does not melt so fast as English ice; but the cause of this phenomenon is, I believe, very different from that assigned for it by the late Governor of Upper Canada. "People in England," he says, "are prone to think that ice is ice; but the truth is, that the temperature of 32° Fahrenheit, that at which water freezes, is only the commencement of an operation that is almost infinite; for after its congelation, water is as competent to continue to receive cold, as it was when it was fluid. The application of cold to a block of ice does not, as in the case of heat applied beneath boiling water, cause what is added at one end to fly out at the other: but, on the contrary, the centre cold is added to and retained by the mass, and thus the temperature of the ice falls with the temperature of the air, until in Lower Canada it occasionally sinks to 40° below zero, or 72° below the temperature of ice just congealed. It is evident, therefore, that if two ice-houses were to be filled, the one with Canada ice, and the other with English ice, the difference between the quantity of cold stored up in each would be as appreciable as the difference between a cellar full of gold and a cellar full of copper; that is to say, a cubic foot of Lower Canada ice is infinitely more valuable, or, in other words, it contains infinitely more cold than a cubic foot of Upper Canada ice, which again contains more cold than a cubic foot of Wenham ice, which contains infinitely more cold than a cubic foot of English ice; and thus, although each of these four cubic feet of ice has precisely the same shape, they each, as summer approaches, diminish in value; that is to say, they each gradually lose a portion of their cold, until, long before the Lower Canada ice has melted, the English ice has been converted into luke-warm water."

There can be no doubt that where an intense frost gives rise to a great thickness of ice, permitting large cubic masses to be obtained after the superficial and porous ice has been planed off, a great advantage is afforded to the American ice merchant, and the low temperature acquired by the mass must prevent it from melting so readily when the hot season comes on, since it has first to be warmed up to 32° Fahrenheit, before it can begin to melt. Nevertheless, each fragment of ice, when removed from the store-house, very soon acquires the temperature of 32° Fahrenheit, and yet when a lump of Wenham ice has been brought to England, it does not melt by any means so readily as a lump of common English ice of similar size. Mr. Faraday tells me that Wenham Lake ice is exceedingly pure, being both free from air-bubbles and from salts. The presence of the first makes it extremely difficult to succeed in making a lens of English ice which will concentrate the solar rays and readily fire gunpowder, whereas nothing is easier than to perform this singular feat of igniting a combustible body by the aid of a frozen mass, if Wenham ice be employed.

The absence of salts conduces greatly to the permanence of the ice, for where water is so frozen that the salts expelled are still contained in air-cavities and cracks, or form thin films between the layers of the ice, these entangled salts cause the ice to melt at a lower temperature than 32°, and the liquefied portions give rise to streams and currents within the body of the ice, which rapidly carry heat to the interior. The mass then goes on thawing within as well as without, and at temperatures below 32°; whereas pure and compact Wenham ice can only thaw at 32°, and only on the outside of the mass.

Boston, May 23.—Sir Humphrey Davy, in his "Consolations in Travel,"* has said, that he never entered London, after having been absent for some time, without feelings of pleasure and hope; for there he could enjoy the most refined society in the grand theatre of intellectual activity, the metropolis of the world of business, thought, and action, in politics, literature, and science.

I have more than once experienced the same feelings of hope and pleasure after having wandered over the less populous and civilised parts of the United States, when I returned to Boston, and never more so than on this occasion, when, after travelling over so large a space in the southern and western States, we spent ten days in the society of our literary and scientific friends in the metropolis of Massachusetts, and in the flourishing university in its suburbs. They who wish to give a true picture of the national character of America, what it now is, and is destined to become, must study chiefly those towns which contain the greatest number of native-born citizens. They must sojourn in the east, rather than in the west or south, not among the six million who are one half African and the other half the owners of negroes, nor among the settlers in the back-woods, who are half Irish, German, or Norwegians, nor among the people of French origin in Louisiana; for, however faithfully they may portray the peculiarities of such districts, they will give no better a representation of America, than an accurate description of Tipperary, Connemara, the West Indies, French Canada, Australia, and the various lands into which Great Britain is pouring her surplus population, would convey of England.

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* P. 168.

Among other scientific novelties at Boston, I was taken to see two magnificent skeletons, recently obtained, of the huge mastodon, one of them found in Warren county, New Jersey, which a farmer had met with six feet below the surface, when digging out the rich mud from a small pond newly drained. There were no less than six skeletons, five of them lying together, and the sixth and largest about ten feet apart from the rest. A large portion of the bones crumbled to pieces as soon as they were exposed to the air, but nearly the whole of the separate specimen was preserved. Dr. John Jackson called my attention to the interesting fact that this perfect skeleton proved the correctness of Cuvier's conjecture respecting this extinct animal, namely, that it had twenty ribs like the elephant, although no more than nineteen had ever been previously found. From the clay in the interior within the ribs, just where the contents of the stomach might naturally have been looked for, seven bushels of vegetable matter had been extracted; and Professor Webster, of Harvard College, had the kindness to present me with some of it, which has since been microscopically examined for me in London by Mr. A. Henfrey, of the Geological Survey. He informs me that it consists of pieces of the small twigs of a coniferous tree of the cypress family; and they resemble in structure the young shoots of the white cedar (*Thuja occidentalis*), still a native of North America, on which, therefore, we may conclude that the mastodon fed.

But a still nobler specimen of this great proboscidian quadruped was exhumed in August, 1845, in the town of Newburg, New York, and purchased by Dr. John C. Warren, Professor of Anatomy in Harvard University. It is the most complete, and, perhaps, the largest ever met with. The bones contain a considerable proportion of their original gelatine, and are firm in texture. The tusks, when discovered, were ten feet long; but the larger part of them had decomposed, and could not be preserved. The length of the skeleton was twenty-five feet, and its height twelve feet, the anchylosing of the two last ribs on the right side affording the comparative anatomist a true gauge for the space occupied by the intervertebrate substance, so as to enable him to form a correct estimate of the entire length. Dr. Warren gave me an excellent Daguerreotype of this skeleton for Mr. Clift, of the College of Surgeons in London.

Nothing is more remarkable than the large proportion of animal matter in the tusk, teeth, and bones of many of these extinct mammalia, amounting in some cases, as Dr. C. T. Jackson has ascertained by analysis, to 27 per cent., so that when all the earthy ingredients are removed by acids, the form of the bone remains as perfect, and the mass of animal matter is almost as firm, as in a recent bone subjected to similar treatment. It would be rash, however, to infer confidently from such data that these quadrupeds were mired at periods more modern than the fossil elephants found imbedded in similar clayey deposits in Europe, for the climate prevailing in this part of America may possibly have been colder than it was on the eastern side of the Atlantic. At the same time, I have stated in my former "Travels,"* that all the mastodons whose geological position I was able to examine into, in Canada and the United States, lived subsequently to the period of erratic blocks, and the formations commonly called glacial. I have also shown that the contemporary freshwater and land shells were of such species as now live in the same region, so that the climate could scarcely have differed very materially from that now prevailing in the same latitudes.

During my stay at Boston, as I was returning one evening through Washington Street, I fell in with a noisy rabble of young men and boys, some of whom were dressed up for the occasion in rags, and provided with drums, sticks, whistles, tin-kettles, and pans, with other *musical* instruments, most of them on foot, but some mounted and sitting with their faces towards the horse's or ass's tail, others with banners, calling out, "Hurrah for Texas," for they styled themselves "the Texas volunteers." This I found was an anti-war demonstration, and shows that there is a portion even of the humblest class here, who are inclined to turn the aggressive spirit and thirst for conquest of the Washington Cabinet into ridicule.

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* Vol. I. pp. 51. 55. Vol. II. p. 65.

June 1.— Sailed for England in the Britannia, one of the Cunard line of steamers, the same in which we had made our outward voyage. For several days a white fog had been setting in from the sea at Boston, and we were therefore not surprised to find the mist so dense off the harbour of Halifax that the lighthouse was invisible. By a continual discharge of guns, which were answered by the firing of cannon at the lighthouse, our captain was able safely to steer his ship into the harbour. In the post-office we found letters from England, left by a steamer which had touched there two days before, and had come from Liverpool in nine days.

June 7.— When we had quitted Halifax five days, and were on the wide ocean, the monotony of the scene was suddenly broken by the approach of a group of icebergs, several hundred in number, varying in height from 100 to 250 feet, all of the purest white, except such portions as, being in shade, assumed a greenish hue, or such as acquired a delicate rose-colour tint from the rays of the evening sun. These splendid bergs were supposed to have floated from Placentia Bay, in Newfoundland, where a great many merchantmen had been imprisoned for several months by a huge barrier of ice. They were almost all of picturesque shapes, and some of them of most fantastic form; three in particular, which came within a mile of us. One presented a huge dome, rising from the centre of a flat tabular mass; another, more than 100 feet high, was precisely in the form of a pyramid, quite sharp at the top, and the angle formed by the meeting of two sides, very well defined; at the base of it rose a hummock, which we called the Egyptian Sphinx. The third was covered with pinnacles, and seemed like a portion of the Glacier des Bossons, in the valley of Chamouni, detached and afloat. Erect on one side of it stood an isolated obelisk of ice, 100 feet high, which increased very slightly in size towards the base. Some of these bodies appeared to the north, others far to the south of us, the loftiest of the whole rising out of the water to the height of 400 feet, according to the conjecture of the seamen, who thought they could not be far out in their estimate, as there was a schooner alongside of it, and they could tell the height of her mast within a few feet. We sailed within half a mile of several bergs, which were 250 feet, and within a quarter of a mile of one 150 feet in height, on which, by aid of the telescope, we distinctly observed a great number of sea-birds, which looked like minute black specks on a white ground. I was most anxious to ascertain whether there was any mud, stones, or fragments of rock on any one of these floating masses, but, after examining about forty of them without perceiving any signs of foreign matter, I left the deck when it was growing dusk. My questions had excited the curiosity of the captain and officers of the ship, who assured me they had never seen any stones on a berg, observing, at the same time, that they had always been so eager to get out of their way, and in such a state of anxiety when near them, that such objects might easily have been overlooked. I had scarcely gone below ten minutes, when one of the passengers came to tell me that the captain had seen a black mass as large as a boat on an iceberg, about 150 feet high, which was very near. By aid of a glass, it was made out distinctly to be a space about nine feet square covered with black stones. The base of the berg on the side towards the steamer was 600 feet long, and from the dark spot to the water's edge, there was a stripe of soiled ice, as if the water streaming down a slope, as the ice melted, had carried mud suspended in it. In the soiled channel were seen two blocks, each about the size of a man's head. Although I returned instantly to the deck when the berg was still in sight, such was then the haziness of the air, and the rapidity of our motion, that the dark spot was no longer discernible. Such instances of the transportation of rocks by ice, occurrences most interesting to geologists, were first recorded by Scoresby, in the northern hemisphere; but from the accounts given me by Sir James Ross and Dr. Joseph Hooker, they are evidently much more common in the icebergs drifted from the Antarctic than from those of the Arctic regions.

When we were among the ice, the temperature of the water was 45° Fahrenheit. On the day before we came up with it, the passengers had already begun to look out warmer clothing, and shawls and great coats were in requisition. Occasionally we were steering amongst small pieces of ice, and the wheel at the helm was turned first one way and then another, reminding me of the dangers of the Mississippi, when we were avoiding the bumping against logs. In the fore part of the vessel the watch was trebled, some aloft and others below, and we went on at the rate of nine miles an hour, and once in the night came within less than a ship's length of a large berg. A naval officer on board declared to me next morning that the peril had been imminent; that he had weathered a typhoon in the Chinese seas, and would rather brave another than sail so fast in the night through a pack of icebergs. He now thought it most probable that the President steam-ship had been lost by striking a berg. He reminded me that we had seen a pinnacle of ice, distant 100 yards or more from the main body of a berg, of which it was evidently a part, the intervening submerged ice being concealed under water. How easily, therefore, might we have struck against similar hidden masses, where no such projecting pinnacle remained to warn us of our danger.

At half-past nine o'clock on the evening of the 8th June, it being bright moonlight, some hours after we had lost sight of the ice, when we were in a latitude corresponding to the South of France, we saw in the north a most brilliant exhibition of the Aurora Borealis; the sky seemed to open and close, emitting, for a short period, silvery streams of light like comets' tails, and then a large space became overspread with a most delicate roseate hue. The occurrence of this phenomenon in the summer season, and in so southern a latitude, seemed to point to its connection with the ice which was drifting over the sea between us and Newfoundland, now to the N.W. of us. We learn from Sir James Ross's narrative of the late antarctic expedition, the highly interesting fact, that when the Aurora Borealis was playing over the great barrier of coast ice on the shores of the antarctic land, it partook distinctly of the irregular and broken shape of the icy cliffs over which it hovered.*

June 12. — A pilot came on board from Ireland, with English newspapers, filled with debates on the repeal of the corn-laws. Among the foreign news, a considerable space was occupied with the affairs of France, Germany, Italy, India, China, and there was only a short paragraph or two about America, North and South. I had been travelling long enough in the New World to sympathise fully with the feelings of some of my American fellow-passengers, who were coming abroad for the first time, when they expressed their surprise at the small space which the affairs of the United States occupied even in English journals. It is a lesson which every traveller has to learn when he is far from home, and seeks in a foreign newspaper to gain some intelligence of his native land. He is soon accustomed to find that day after day even the name of his country is not mentioned.

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* Vol. II. p. 221. 1842.

The speed of our steamer had been constantly increasing as the weight of coal diminished. The length of the voyage, therefore, to America might be considerably abridged if the quantity of coal were lessened by a day and a half's consumption, the steamer starting from the West of Ireland, to which passengers might be conveyed in a few hours, by steam-boat and railway, from Liverpool.

June 13., *Saturday.* — Anchored off Liverpool at half-past ten o'clock in the evening, having made the passage from Boston in twelve days and a half, it being nine months and nine days since we left that port.

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